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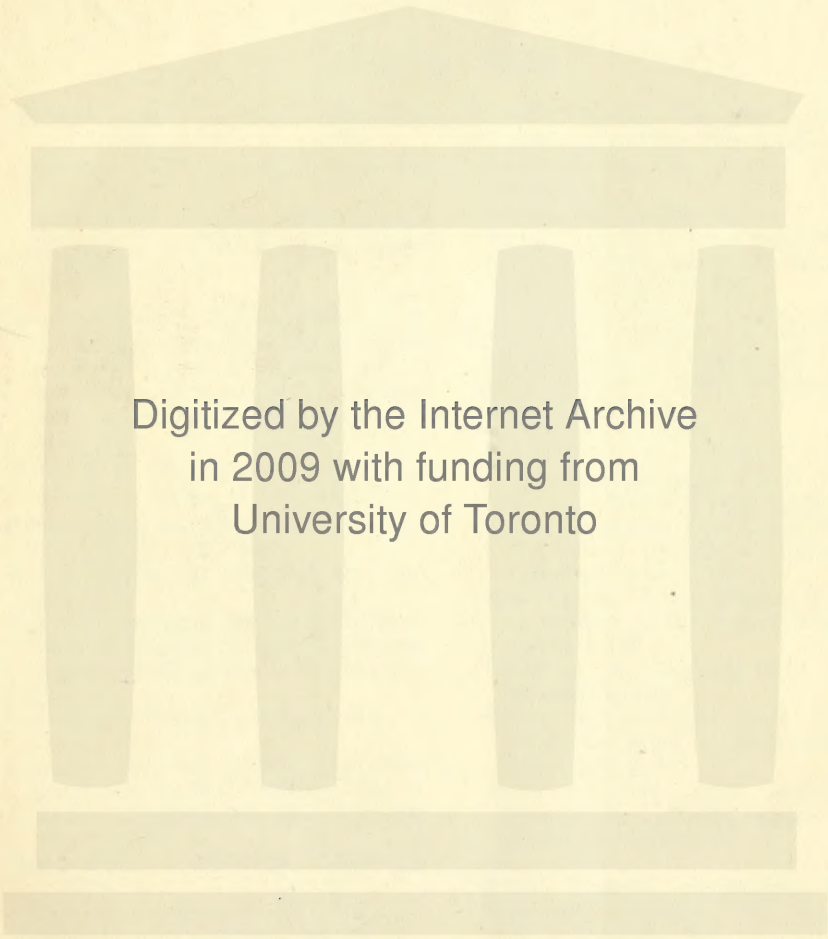
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The Canadian
Medical Association Journal

Vol. VIII. JANUARY, 1918 No. 1

OCCUPATION IN THE TREATMENT OF PULMONARY TUBERCULOSIS

By Captain J. R. Byers, *C.A.M.C.*

Medical Officer in charge Sanatoria Ste. Agathe des Monts, P.Q.

So much has been written about *rest* combined with fresh-air and alimentation as treatment of pulmonary tuberculosis, especially on this side of the Atlantic, that the practice of forbidding the patient with lung disease to take a sufficient amount of exercise at the proper time has been carried in many instances to excess, with the result that he remains weak, although apparently in a state of restored health. Roughly the treatment of pulmonary tuberculosis is divided into two distinct, yet merging phases, i.e., the *active* and the *passive*. In the active stage, rest is indicated practically to a surgical degree, growing less and less until the passive stage is reached, when it might be better to eliminate the word rest, and use the words *modified work* to indicate the routine to be followed as long as the case progresses favourably. The Nordrach system of treatment of pulmonary tuberculosis, as carried out by Walther and later by Brehmer involved much exercise, in addition to fresh air and food, whereas the Dettweiler system called for a great deal of rest rather than exercise. At Nordrach it was common practice to order walking from ten to twenty miles a day as long as the patient showed no signs of reaction. In America we have leaned, with but few exceptions, strongly to an excess of rest, and it came to us almost as a heresy when Dr. Marcus S. Paterson of the Brompton

Read at the forty-eighth annual meeting of Canadian Medical Association, Montreal, June 13th, 1917.

Hospital Sanatorium at Frimley published his work on the value of work in the treatment of pulmonary tuberculosis. His very carefully arranged routine, the fine graduation of the class of labour, the painstaking medical supervision, and the excellent results obtained, proved that work was not only not harmful when used at the right stage of treatment, but was highly beneficial. Later J. W. Allan, S. R. C. Halcourt, H. L. Barnes and others published the results of their operations in the treatment of pulmonary disease by means of graduated labour in the passive stage of the disease. All showed the same beneficial results and came to the conclusion that graduated work was a great help in forming fibrosis, establishing immunity, and preserving the patient's morale.

The excellent results of using regulated work in the treatment of pulmonary tuberculosis by Dr. Paterson prompted A. C. Inman, superintendent of the Brompton Hospital Laboratories, to make an extensive study of the question from the laboratory point of view. Inman's investigation was prompted also by Sir Almroth Wright's conclusions that there were three principal agencies by which immunizing responses could be evoked in the organism: (1) By the inoculation of bacterial vaccines; (2) By artificially induced auto-inoculations; (3) By spontaneous auto-inoculations. The result of his observations appeared to show that auto-inoculation could be produced by the use of regulated work and exercise, and at the same time controlled. He found that in forty-one out of forty-three cases the opsonic index (of patients at work) was at some time of the day well above normal, and what is of even more importance, in no case did the work, even though severe, lower the index below the normal line: the auto inoculation was never so great as to produce a negative phase and therefore was never in excess.

In other words the clinical picture may be taken as showing practically the indication for control of the patient's work as if the opsonic index readings were taken. If the patient progressed with his work without showing fever, and other signs of intoxication, such as lassitude, headache, loss of appetite, etc., the opsonic index may be taken as being in the positive stage, whereas should these distressing symptoms occur, Inman's work goes to show that the index is low or in the negative stage. Paterson laid great stress on the opsonic index as a control, but the estimation of the opsonic index in each case treated would require a great deal of laboratory work with a technique perfect in order to avoid error, and even then there must be a fair percentage of error. It would appear

that the same control and results can be obtained by a careful observation of the patient's clinical status, especially as to fever, lassitude, and approaching toxic symptoms.

It is interesting to note that twenty-three years ago Sir Robert Philip, of Edinburgh, directed a treatment of pulmonary tuberculosis which started with rest, and progressed through carefully graded stages to hard work. He based his work upon the fact that there is a progressive intoxication in tuberculosis produced by the toxines of the tubercle bacilli exerting a vicious influence particularly upon the neuromuscular apparatus. He concluded, that having reduced the toxin production by rest, a physiological cure of "recreation" by the institution of natural movements could be brought about, and the health of the patient restored. His work was so successful, and the classification of the different stages with their prescribed work so carefully laid down, that the whole is well worth a careful study, by one who desires to apply work as part of the treatment in the passive stage of pulmonary tuberculosis.

At the Laurentian Sanitarium it has been our practice to prescribe *walking* as exercise during the passive stage, gradually increasing the amount until the patient was taking two hours on the road daily, and I personally leaned strongly to leg and trunk exercises rather than employing the arms to any great extent, as this method appeared to obtain a desirable result, and lessened the chance of injuring or irritating the lesion.

The civilian patient, paying his own way in whole or part, often on savings, frequently on borrowed funds, and sometimes on actual charity appreciated to the full extent that every detail of the prescribed treatment counted and should be carried out or he was the loser. It was not until I was called upon to direct the treatment of the tuberculous soldier, care-free, receiving free treatment, and in addition the pay of his rank while taking it, that I had a new problem to deal with. The soldier in a large majority of cases would not, or could not appreciate the principles of medicine and surgery as applied to his treatment, and to such an extent that in the first year of my military work 15 per cent. were discharged as unsuitable for treatment on account of drunkenness or crime, and 33 per cent. actually refused to be treated at all, considering the daily routine as too confining, and lacking in interest. I therefore decided that if the treatment of the soldier was to be a success it must be made more interesting, and to this end alone I decided to break from my traditions, and en-

couraged by the published results of the authorities enumerated above, to establish a system of treatment in which a modified work and entertainment would play a part.

I therefore applied to the Canadian Military Hospitals Commission for a work shop in which the men could pass away their spare time, and by its aid kept them from frequenting resorts which would retard their progress. It was gratifying to find that the Commission from the first offered their full assistance, and at once placed my request before the Vocational Training Department with instructions to coöperate with me in establishing not only the shop, but a branch of the Vocational Training Department as we saw fit to apply it to the treatment of pulmonary tuberculosis.

In constructing the shop we followed the modern idea of a chicken house, i.e., a south wall with as much window space as possible, and the other three walls made practically draft free. The windows were screened by cheese cloth, and it was found that by means of two small stoves burning wood, all the south windows could be opened even on the coldest days, while the cheese cloth allowed a perfectly fresh and comfortable atmosphere to be had in which the men could work without coats. The shop is of the following dimensions—$14 \times 28 \times 38$ and has six windows on the south wall, one on the east and west each, and two on the north. In winter all windows except those on the south side are doubled and packed so that no cross draft can occur. The equipment consists of a five horse power electric motor operating a band saw, shaper, mortise machine, and drill. These machines I considered as "safety first" measures in order to save the men using heavy arm work such as sawing or cutting oak and other hard woods in the early stage of work. In addition there are eight completely equipped carpentry and cabinet workers' benches, six typewriting tables with machines, four drawing tables, a library of books of instruction, and an annealing and fume chamber. The shop is in charge of Sergeant John McLean who has had seven years technical training, and superintends all the classes of work.

In conjunction with Mr. T. B. Kidner and Mr. J. H. Sexton of the Vocational Training Department, the following classification of the patients and suitable work was drawn up, and is now in use.

Classification of Patients

The patients are divided into three classes as follows:

Class A (Bed cases): Those patients who are suffering with

the disease in an acute or toxic stage, and remain in bed in the infirmary until all fever and distressing symptoms have subsided. They then graduate into

Class B (Porch cases): When they are allowed to attend the meal table three times daily, and rest in open air in the porches in reclining chairs during the remainder of the day. By careful clinical observation they are gradually graded into the next class as evidences of lessened catarrh, increased tone, and presence of fibrosis of the lesion are established, coming to

Class C (Exercise and Workshop cases): Beginning with fifteen minutes' walking, morning and afternoon, the exercise is increased until four hours daily can be accomplished without signs of relapse. Half of this time must be spent in the workshop after one half hour of walking in the morning and afternoon has been reached. If at any period in the treatment, a patient develops symptoms of toxæmia, takes cold, or is otherwise indisposed he reverts at once to Class "A" until the danger is past.

At first it was my intention to limit the work to those of Class "C", but I found that I had in the lighter handicrafts a means of combating that ever present and distressing disease *neurasthenia*, which is so common to the tuberculous bed-ridden patient, and which at times would almost appear to accentuate the symptoms denoting toxæmia. The infirmary patients welcomed the idea of being allowed to join in the scheme, and we arranged that all those who were not exceedingly ill would be allowed to participate in the work. Under careful regulations Class "A" are allowed to draw, embroider, knit, crochet, do card-board work, weave raffia, and study, all in moderation.

Patients in Class "B" do more of the same kind of work as done by Class "A" patients, and as their strength increases begin to undertake heavier work, such as reed basketry, stenography, penmanship, and classical study.

Class "C" patients having been prepared for active work in the shop by walking and other exercises involving light duty, report to the shop where they are instructed in such arts and crafts as basketry, carving, modelling, metal work, picture framing, illuminating, engraving, stencilling, cabinet and toy making, typewriting, design and drawing, further study and instruction in classics and mathematics, while in the summer the garden gives those whose tastes lie in this direction ample opportunity to experiment and study plant growth and at the same time beautify the grounds of the institution.

In addition to the actual shop and school work, we put on two moving picture shows a week, having part of the evening pictures devoted to instruction by film projection and part of an entertaining nature.

From the moment of admission the patient is of course under continual medical supervision and the course is carried on if:

(a) The patient's nutrition is maintained or improves.

(b) The temperature is normal.

(c) No accidents, such as hæmoptysis, or other symptoms occur.

The presence of slight cough with some expectoration, even with acid fast bacilli, does not appear to contraindicate the work as long as the encapsulating fibrosis appears sufficiently dense as to prevent enough absorption of the toxines as to cause systemic symptoms, and we have noted that in many cases especially in the chronic focal types cough and expectoration have not only lessened, but actually cleared up while the patient was engaged in his regular vocational work.

The conclusions I have drawn from the observation of the application of vocational training, and work as applied by us are:

1. That properly regulated, and the greatest care having been exercised in the selection of the work as adaptable to the patient having been made, and with a willing coöperation on the patient's part, work is highly beneficial to the sufferer from pulmonary tuberculosis.

2. That even Class "A" patients appear to progress more rapidly when allowed to fill out their day in part with some interesting finger work, rather than lie still and in all probability brood over their sad lot.

3. That contrary to expectation, relapses have been very rare (less than two per cent.), and that in a year there has only been one small hæmorrhage following exposure to the workshop.

4. That the vocational training while not by any means making a man a wage earner in a new field, has in a large number of cases started new lines of thought regarding the life to be led by the patient following discharge from the sanatorium and stimulated not a few of the younger patients to improve themselves in knowledge, with a desire to rise above the level which they occupied in society before enlistment, and to become better and more useful citizens than they otherwise would have been. In addition the work has given an air of contentment and happiness in the Sanatorium. Generous competition has grown up amongst the men as to the

finish and design of the work in hand. Married men have made their children happy with many novel toys and models of furniture, while many a wife has been gladdened by the production of excellent house furniture resulting from her husband's handiwork.

5. The *morale* of the men has improved in a remarkable manner, there is far less tendency to drunkenness, absence without leave, and more serious attention to the routine of the treatment is exhibited now as compared with those dull days previous to the introduction of the system.

6. The results of treatment while not showing any marked change from those obtained in civilian sanatoria, are decidedly better than obtained during the first year of military work, and a comparison of the large percentage of men who refused treatment last year with the very small number now applying for release furnishes one of the strongest proofs of their appreciation of this method of loosening nervous tension and making the prolonged and tedious treatment bearable.

I am firmly convinced that in the application of properly regulated work of an interesting nature in the treatment of pulmonary tuberculosis we have added a fourth word to our code, which should read *rest, fresh air, good food, and work.*

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DIAGNOSIS OF RENAL TUBERCULOSIS, FROM THE DEPARTMENT OF UROLOGY, ROYAL VICTORIA HOSPITAL, MONTREAL

By D. W. MacKenzie, M.D.

THE recent history of renal tuberculosis shows a very remarkable advance in the diagnosis, pathology, and treatment of this relatively common, and very serious disease. Cystitis is usually secondary to extra-vesical causes, and its cure is generally accomplished by the removal of such causes. Only within the last few years have we learned to recognize renal tuberculosis clinically through the persistent bladder irritation which it produces. Certainly no one is justified in treating locally, cases of bladder irritation until all means have been exhausted to exclude the existence of renal tuberculosis.

Tuberculosis of the kidney is a condition which is essentially chronic; insidious in its onset, beginning usually in one kidney; progressive in character, and unless relieved by surgical means proving fatal except in a very small percentage of cases. Notwithstanding the fact that much has been said and written within the last few years concerning tuberculosis of the kidney many of the patients suffering from this disease are not referred for operation until the process is well advanced. During the past three years the average history of patients operated on for tuberculosis of the kidney in our service at the Bellevue Hospital was two years, and the pathological findings seemed to point to a much longer course. Of fifteen cases of renal tuberculosis treated at the Royal Victoria Hospital in the past four months, five showed symptoms of over three years, six over one year, and four less than one year. Three had suprapubic cystotomies, and eleven had bladder irrigation from six months to three years. Braasch, from the Mayo Clinic, from an extended period reported two hundred and twelve operations upon patients for renal tuberculosis. Of these 71 per cent. had vesical symptoms for over one year; 37 per cent. for over five years. It is needless to say that for the best interest of patients such cases should come to operation long before the lesions become so advanced. Early recognition

Read at the annual meeting of the Medical Society of Nova Scotia, July 4th, 1917.

of the disease not only improves the prognosis, but what is more important, it may prevent the unfortunate deep-seated infection of the bladder, the bane of post-operative treatment of tuberculosis of the urinary tract.

Why should these patients be allowed to suffer so long? There are several reasons. First, a thorough knowledge of tuberculosis of the genito-urinary tract is not found among our general practitioners; second, the treatment by surgical means is not generally known to be the best; third, in the majority of patients the symptoms are slight though significant and are not heeded. A slight persistent irritation of the bladder which does not yield to ordinary therapeutic measures is just as suggestive of renal tuberculosis as a slight persistent cough is of pulmonary tuberculosis. Diagnosis in the proper hands can be positively made. The process in the early stages is generally unilateral. The treatment by nephrectomy in the early stages is fraught with good results. Continued nocturnal bladder irritation accompanied by pyuria should be considered early tuberculosis until proven otherwise. There are certainly numberless cases of this disease which have been, and are treated for cystitis. The diagnosis although often beset with difficulties, is one which can be made with a nice degree of exactness. The poor results in treatment are due to late diagnosis, or the late institution of the proper treatment. There is no doubt that the failures of relief of symptoms are in direct proportion to the delay in proper treatment. In 80 to 90 per cent. of the cases the initial symptoms are those of cystitis. The onset is usually gradual. The bladder irritation may be due to reflex irritability of the bladder in the early stages, and later to actual lesions of the mucous membrane all the way from a slight ulceration to the extensive erosion of the bladder surface. The patient may complain of frequency with very little pain and only slight burning on urination. Frequency may vary from every two hours to every fifteen minutes during the day, and twice to fourteen times at night. In many cases the desire to urinate must be satisfied at once: there is distinct urgency. These local symptoms may go on almost indefinitely, or there may be periods of remission, when there is comparative comfort.

If the urine be examined at this time, it will be found that there is a polyuria; the urine is pale, of low specific gravity, acid in reaction with some albumen, and little or much pus. About 15 per cent. of the patients complain of hæmaturia, and most of them show blood microscopically. The symptoms referable

to the kidney are notably few. In about 12 per cent. of the cases there is pain or discomfort over the affected kidney. These symptoms occasionally mark the onset of the trouble. The kidney may be large on palpation. This is caused by an actual enlargement of the kidney itself, or by a hydronephrosis due to blocking of the ureter. Severe abdominal pain sometimes ushers in the symptoms, followed later by the bladder irritation. The general symptoms such as chills, fever, night sweats, and loss of weight, play a very small part in the diagnosis of the condition. In many of them if the history is enlisted carefully, there will be found that preceding the appearance of any symptoms there is a period of gradual constitutional deterioration of an indefinite character. However, in the majority of cases these symptoms are not sufficient to attract attention.

What, then, is the procedure when a patient presents himself with a persistent irritability of the bladder, to determine whether or not these symptoms are due to renal tuberculosis, and if so, which kidney is diseased?

First, the careful history. Patients having any of the symptoms described above should be interrogated with tubercular kidney in mind. How long have the symptoms continued? Is there frequency of urination? Does the patient have to arise at night to urinate, and if so, how often?

A careful examination of the urine is the next step. If pus is present in successive specimens, a search should be made for tubercle bacilli. Demonstration of this organism assures the diagnosis. If the organism be not found, it does not force the conclusion that tuberculosis is not present, for the reason that it is sometimes difficult to find tubercle bacilli in the urine, and particularly in the early stages. However, with patience and some experience it will be found that the tubercle bacilli can be found in 80 to 90 per cent. of such cases. The other method, that of guinea-pig inoculation, may demonstrate the presence of the organism, and is no doubt more *eloquent* than the staining method, but it has the additional disadvantage of consuming a great deal of time. A complete diagnosis is only made by catheterization of the ureters. All these patients should have the advantage of a thorough cystoscopic examination where there are even the slightest symptoms which would lead one to suspect that there is tuberculosis of the urinary tract. This is no formidable procedure. In the majority of cases it does not require a general anæsthetic, and gives us more information than we can get in

any other way. It is possible by a consideration of their symptoms, examination of the ureter by vagina or rectum, and possibly by tuberculin, to locate the disease in one side or the other, but this gives no information as to the status of the other kidney—a very important factor in the prognosis and treatment. It is not always possible by the first cystoscopy to determine enough to warrant radical treatment. One thing that is characteristic of these patients is the extreme sensitiveness of the bladder and the consequent inability to hold much fluid. This naturally interferes with a successful examination. However, with a little patience on the part of the doctor, and rest and possibly slight local treatment for the patient, a successful cystoscopy with the aid of a local anæsthetic is possible in almost every case. In a bladder much involved it is a difficult procedure even in competent hands to find and catheterize the ureter, the mucous membrane frequently being so involved that the normal landmarks are entirely obliterated. Frequently the intra-vesical picture is such that in the hands of an expert in cystoscopy diagnosis and location of the disease is assured. The appearance of the ureteral orifice may be such as to indicate which kidney is involved, The opening of the ureter may be so surrounded with granulation tissue that the passage of the catheter is not possible. Strictures of the affected ureter are often found of sufficient extent to prohibit the passage of the catheter, or even to prevent the infected material from the kidney from entering the bladder. This may allow the bladder partially to recover, although probably from time to time enough may be discharged to give intermittent attacks of bladder irritability. Where the ureter is completely occluded on the diseased side, the term "auto-nephrectomy" has been used to express in a way the effect upon the patient's general condition. If it is possible to catheterize and obtain specimens of urine from each kidney, the findings are of enough significance to warrant early radical treatment. The urine from the diseased kidney, on gross examination, is much greater in amount than that from the other kidney, often very pale, lacking in the yellow colouring of the normal side. Further examination shows it to be acid in reaction of low specific gravity, with a trace of albumen, pus and tubercle bacilli. The urea percentage is lower as a rule than on the normal side. The phthalein output is very much lower than the opposite side, which may be higher than a normal output.

Given a continued bladder irritablitiy and acid pyuria with cystosopic findings such as I have described, without demonstrating

the presence of tubercle bacilli, the diagnosis is justified and radical procedure should be at once instituted.

In our service at the Royal Victoria Hospital I have adopted as a working basis for the staff the following routine schedule:

1. History—General.
   Urological—Pain
   Frequency.
   Hæmaturia.
   Cloudy urine.
   Crystals and calculi.
   Previous treatment.
2. Physical Examination.
   (a) General.
   (b) Urological—Inspection—Tumours, urethral discharge, œdema, malformations,etc.
   Palpation—Bimanual of renal regions, tenderness, muscular spasm, tumours, varices.
   Rectal—prostate vesicles—size, contour, consistency, fixation and tenderness.
   Exploration of urethra with soft catheter.
   Residual urine.
   Capacity of bladder.
   (c) Blood count and smear.
3. Urinalysis.
4. Renal function (1 c.c. phenol-sulphone-phthalein intramuscularly).
   Appearance time.
   First hour——per cent.
   Second hour——per cent.
5. Blood culture (septic cases).
6. X-ray.
7. Cystoscopy—Urethra.
   Bladder mucosa—cystitis, ulceration, trabeculation, diverticulum, neoplasm, calculus.

Ureteral orifices—size, shape, position and function.

Ureteral catheterization—	Right.	Left.
Microscopic	——	——
Volume	——	——
Urea	——	——
Urea-Volume	——	——
Microscopic	——	——
Smear	——	——
Culture (Lab. no. ——)		
Guinea-pig inoculation:		

Comparative Function (c.c. phenol-sulphonephthalein intravenously),
Appearance time——in minutes.
Amount in 10 minutes——per cent.
Amount in bladder at close —— per cent. (leakage).

10 c.c. Indigo-carmine intravenously (when necessary) to locate internal openings.
(Obstruction to catheter).

X-ray catheters—pyelogram
Wax-tipped catheters } where indicated.

8. Treatment.

Another important aid is the external physical examination. Nodules in the epididymis, vas, or prostate are strongly suggestive; palpation of a thickened ureter by vagina or rectum is always suspicious that the disease is on that side, if urinary tuberculosis has been previously proven.

Radiography may disclose the outline of the kidney, and may also show calcareous deposits. Pyelography may be used in those cases where the tubercle bacilli have not been demonstrated, and only where necessary.

Search for the tubercular lesions in other parts of the body should not be neglected. Tuberculin tests may aid, but are not to be relied upon. The skin reactions are not of particular value because even if positive, they do not aid in localizing the process. Subcutaneous reaction may aid, in that besides being positive, it may occasion pain in the sides of the affected kidney. I have not found it of any great assistance.

Renal tuberculosis must be differentiated from pyelonephrosis, renal calculus, renal tumours, non-tuberculous cystitis, vesical calculus, vesical tumours, etc.

Among the many interesting features of renal tuberculosis none is more important than the apparent cures of the disease. The disputes among the relatively few practitioners who would treat renal tuberculosis without operation, and the many who urge prompt nephrectomy as soon as the diagnosis is made, can only be settled by a clearer understanding of what the apparent cure of renal tuberculosis means. The underlying difficulty in reconciling the opposing views is probably a lack of thorough understanding of the relation between the pathological lesion in the kidney caused by tuberculosis, and the symptoms arising therefrom. Thus it is not generally appreciated that the variations in the patient's general health as well as in his renal and vesical symptoms are due to alteration in retention (renal or vesical) or to changes in the activity of the pelvic or vesical regions, rather than to changes in the kidney parenchyma itself. Every case of early renal tuberculosis submitted to operation places in our hands a possible specimen suggestive of the fact that the renal lesions are far older than the duration of the symptoms would suggest. Indeed, the mere presence of surgical tuberculosis in the parenchyma of the kidney causes no symptom. Upon this fact it is scarcely necessary to insist. The familiar case history with its exclusive vesical symptoms is sufficient evidence that the lesion in the kidney parenchyma does not make itself felt until one of two things happens, either it extends through the capsule and excites perinephritis, or extends to the pelvis and there sets up tuberculous pyelitis. Perinephritis is relatively rare and need not concern us here.

Tubercular pyelitis is common. Doubtless the painful and frequent urination which is often the most prominent early symptom of the disease is at the outset due entirely to tuberculosis of the pelvis and ureter. Judging from the specimens I have seen, this tuberculosis usually takes the form of disseminated sub-epithelial infiltration of the mucous membrane with little tubercles which give to the mucosa a kind of pebbled appearance. At this early stage the cavity of the kidney pelvis is usually very slightly dilated (apparently by the relaxation of its walls). There may be no ulceration except that upon the papillæ, the source of pelvic infection. Yet with lesions so slight as these, the patient may be urinating every hour with considerable straining, urgency and terminal pain. If the kidney is removed at this time the frequent urination is checked as if by magic, and does not return.

The next important pathological change consists in the ex-

tension of the tuberculosis to all the layers of pelvis and ureter, and to the bladder. Upon the mucous surface the tubercles ulcerate, and upon the outside they excite that adhesive inflammation about the pelvis and ureter with irregular thickening of the walls of these channels which is so characteristic of renal tuberculosis. As a result of this ulceration and infiltration the lumen of the excretory channel becomes more or less completely obstructed, and the region above the obstruction dilates. Inasmuch as the cavity of the kidney pelvis itself often becomes almost completely obstructed by this process, the dilatation may affect only one portion of the kidney, though it usually affects the whole organ. Occasionally the obstruction is in the ureter, and the pelvis itself is widely dilated instead of being contracted. As a result of these pathological changes renal colic may occur from the passage of blood clots, or shreds of fibrin or tissue, or pain in the loin may result from distension of the kidney or perinephritis; while a more or less definite sensitiveness and dragging pain in the side may result, either from the extension in the kidney and its pelvis, or from the dragging of the shortened and thickened ureter, or from perinephritis. But if the ureter is not shortened, and if the retention either in one pole of the kidney, or the whole kidney, is sudden and complete instead of being gradual and incomplete, the patient's discomfort may suddenly cease either with, or without renal colic. Even though the tuberculosis has extended down the ureter beyond the point of stoppage, if urine ceases to flow through the ureter the symptoms will promptly cease whether the flow of urine is checked by nephrectomy or by plugging of the duct—autonephrectomy.

In the light of these facts the varying histories of patients with renal tuberculosis is readily understood. The great majority of them have frequent and painful urination, and though from time to time very considerable remission of the symptoms may recur, they never entirely disappear, and as the inflammation progresses, invading more and more of the bladder, the general tendency is for the urinary distress to become more and more marked. Some patients fail rapidly in general health on account of partial retention, usually in the kidney pelvis less often in the bladder. But the exceptional patient may continue to have fairly good drainage and exhibit a most extraordinary good health. On the other hand once in a long while one encounters a case of renal tuberculosis whose symptoms have suddenly and completely ceased, and who has apparently regained perfect health without operation. Such a case I have now under observation, a patient who had active symp-

toms for about one year, and has been relatively comfortable now for about three months. I have also operated on four patients with intermittent or relative comfort from one to six months. Their operative findings showed kidneys with walled off old tubercular cavities calcifying, and fresh lesions in the opposite poles.

The treatment of renal tuberculosis when unilateral is nephrectomy, care being taken to remove all perinephretic infiltration of tuberculous tissue, and to avoid the discharge of any of the secretion from the severed ureter or pelvis. I am in the habit of suturing the wound without drainage. All these patients do exceptionally well.

The candidates who have been successful in passing the recent examinations of the College of Physicians and Surgeons of Ontario are: Adam Ardill, Blind River; Elliott Nichol Ballantyne, London; William Elmer Berry, Madawaska; Harold Austin Boyce, Harrowsmith; James Sinclair Crawford, Sarnia; Thomas Francis Delaney, Sault Ste. Marie; Harold Tremain Jost, Ottawa; Leo. J. Murphy, Ottawa; Alvin James McKay, Woodstock; Harold Chester Nash, Stoney Creek; Lorne William Nixon, Richmond; Hugh James Porter, Freeman; Gordon Earle Richards, Toronto; Charles Vincent Scott, Toronto; Offley Jackson Shore, Glanworth.

THE EFFECTS OF GASSING AS SEEN AT A CASUALTY CLEARING STATION

By Major G. B. Peat, C.A.M.C.

THESE notes have been kept by me as a matter of personal interest, and as attacks of asphyxiating gas resulting in the incapacitating or death of more than a few men at a time are rare now, they may be of some interest to others. As they have been made as attacks occurred, I will give them in that way.

The first time we had any cases really to attend to was in an attack made April 30th, 1916. As it was our "receiving day" I was at the hospital all night. At midnight we heard heavy firing and could see shells bursting along a certain section of our line. About 1.30 a.m. we could distinguish the smell of gas at the hospital. At about 4 a.m. our first cases began to arrive and between now and 8.30 a.m., when our tour ended, we received sixty-five cases. Of these two were dead on arrival and three died in the receiving room before any remedial measures could be begun. There were fifteen very bad cases, twenty-five severe ones, and twenty fairly mild ones.

The first case under my care was an officer who, being on patrol duty, and in his anxiety for the safety of his men neglecting his own, had got badly gassed before he could get back through the wire and adjust his respirator properly. He was intensely restless—almost convulsive. He had agonizing dyspnœa, respirations being 64, and lungs full of moist râles. Pulse 128, good quality. His face was pale and finger nails of a grayish or leaden hue. After being put in bed he received atropine gr. 1–75, morphine gr. 1–6, hypodermically, also inhalations of aromatic ammonia for fifteen minutes. Then oxygen inhalations every hour for ten minutes at a time. At noon he was about the same so I tried giving hydrogen peroxide, one-half drachm to the ounce of water every hour. At three p.m. he was still no better, so I gave oxygen subcutaneously in pectoral regions up to about four litres. After this he became quieter, his colour improved and he seemed better in every way. During the night he got oxygen inhalations every hour and

Read at the forty-eighth annual meeting of the Canadian Medical Association, Montreal, June 15th, 1917.

caffeine gr. ii every three hours. He rested a little and in the morning his colour was good, respirations 50 and pulse 100. His face was puffed slightly. During the day he got oxygen inhalations frequently and caffeine and hydrogen peroxide every three hours and by evening seemed out of danger. From now on treatment was gradually lessened and he was given Major's mixture of potassium iodid to loosen secretion. The second night and third day he slept a great deal. On June 4th he was sent to base. Incidentally he was on duty again after about two months.

Reverting to the taking in, the twenty light cases went to base that morning. The others Captain Selby had been keeping going with oxygen inhalations, aromatic ammonia inhalations and strychnine hypodermics. Two very bad cases died during the day. In the afternoon we decided to give hydrogen peroxide by mouth one drachm in one ounce water every two hours to thirty-five cases. To five desperate cases we gave oxygen subcutaneously about 3 to 4 litres. To these five and to twelve other bad cases we gave caffeine. To ten of the worst we gave oxygen inhalations every hour during the night. One case died in the night. In the morning we judged it safe to send thirty-one to the base. During the forenoon another case died. These last two cases had each received oxygen subcutaneously and colour had improved and they had become quiet, but they weakened and died from cardiac failure.

There were now twelve cases, four of which were very grave. These got the hydrogen peroxide by mouth and a change from caffeine to camphor oil 1 c.c. hypodermically every three hours was made to get the effect on the lungs as well as heart. Digitalin gr. 1–100 hypodermically was also given every three hours. All except one improved rapidly, and this one had got off his stretcher and walked a few steps before the orderly could stop him. After this he failed rapidly but was kept going with oxygen subcutaneously three times daily, as well as the stimulation above mentioned. The fourth evening his circulation was so poor that I bled him, taking 8 ounces very slowly. His colour became much better and he also became quiet, but died next morning from heart failure. The other three cases improved remarkably, losing their blue colour and from being restless and in agony became quiet and comfortable. A fifth case passed urine and fæces involuntarily and had lost power of speech. With treatment as these four above mentioned, he gradually improved, but his speech was confined even after four days to "Yes" and" No." The worst cases were able to go to the base on June 6th.

Taking the whole number of cases there were several noticeable things. First was the extreme restlessness of the severe cases. They might stay still for a few moments, but then they would rise on the elbows or toss from side to side or jerk around in a "fish on land" manner. All this time they would be coughing, gasping, and fighting for breath. Next was the colour. About twenty were pale, about twelve or fifteen more were pallid, with greyish or leaden hued mucosæ and nails, fifteen or twenty were flushed or dark and fifteen others were cyanotic with mucous membranes from dusky red to a peculiar blue, some looking as if the lips had been marked with a blue crayon. Of these types the pale ones seemed more actively restless, but the cyanotic ones were the more thoroughly distressed and the most dangerously ill.

Coughing in itself was not a marked symptom, being present in about 60 per cent. and severe in 20 per cent. Taking the symptoms as a whole they might be divided as follows:

Respiratory. Nearly all cases complained of an oppression and tightness in the throat and lungs and an intense desire to "raise something". Many described it as a burning in throat and chest. In forty cases the breathing was increased, varying from thirty to seventy respirations per minute. In a few it was a grunting catchy type as in pneumonia. This fast breathing did not diminish for twenty-four hours, but after thirty it had quietened down markedly. In five cases there was agonizing coughing with severe straining and vomiting. In twenty-five others there was a moderate amount of cough, with slight vomiting and expectoration of thick mucus, sometimes blood-flecked. The longer the cough lasted severely, the more blood flecks were apparent. Usually the cough was unproductive. If patients vomited at the start they were much relieved.

The physical signs were much as in an acute attack of asthma, the lungs being full of all sorts of râles.

Circulatory. Oxygenation in the worst cases, in fact in all but seven cases, was excessively bad. The lips in twelve or thirteen cases were absolutely blue, more so than one could possibly imagine who had not seen them. Many others had lips of a greyish or leaden hue. In twenty cases the hands varied from dusky red or bluish red to a leaden hue. Practically all the severest cases had leaden-hued nails. In those recovering the colour of the lips and hands gradually improved, though in many the nails retained a peculiar greyish shade for days.

The pulse at first seemed very little affected—being really remarkably good. In the very severe cases it went to pieces rapidly. After a short stay in hospital, fighting and straining, we noticed that the slightest exertion caused great weakness and deranged the pulse markedly. From remarks made by the soldiers it seems that on or after the attack many men would partially recover and try to stagger away or to obey orders and suddenly collapse and die in a few seconds. The heart showed no dilatation at first, but after several days three cases had the heart enlarged to the left and slightly also to the right. Heart sounds remained without murmurs.

In the cases I bled the blood was very dark and clotted very quickly.

Digestive. Many complained of burning in œsophagus and stomach. Nausea and vomiting also occurred in many cases. The tongue was generally covered with a whitish yellow fur, but this cleared up soon. It was more marked in those getting hydrogen peroxide. Diarrhœa was present in seven cases. The great majority were obstinately constipated. In one case the bowels moved involuntarily in bed for three days. The appetite except in the very severe cases was good.

Nervous. There was a great restlessness in severe cases from the fight for air. These cases, even on improving had great difficulty to sleep or rest, though once they did they benefited exceedingly. The lighter cases were more inclined to sleep. Many were dazed and their faculties were blunted for several days. One case lost all power of speech for three days and then could say only "Yes" and "No". He passed fæces and urine involuntarily. Another knew when he wished to urinate but paid no heed to urinals, etc., and passed it over the stretcher.

Pathology. The base of the tongue, epiglottis, larynx and trachea were congested. The lungs showed many petechial patches under the visceral pleura. There were also many blebs, air filled, all over the surface of some of the lungs, especially the apices and upper lobes. These bullæ varied from the size of a pin head to that of a walnut. Those dying early showed marked œdema of the lungs. Those dying later showed small areas of consolidation much as in broncho-pneumonia.

The heart seemed normal. The digestive tract showed congestion in the stomach. In one case, the whole colon was greatly distended.

Treatment. After seeing these cases and trying various things I concluded that the main indications were:

1. Get oxygen into the system.
2. Keep the patient quiet.
3. Relieve the heart and keep it supported.
4. Relieve the lungs and get rid of the secretions and detritus.

1. Oxygen. Patients must be put out of doors if possible and if not, in the most airy wards available. In either case they must be kept warm artificially. We used cylinders having a rubber tube attached. This tube was either inserted between their teeth or else a funnel or cone of paper was fixed to the end of the tube and this placed over the nose and mouth. With either way the relief was marked, the patients begging for it and saying what ease it gave them.

In extreme cases some other methods seemed advisable, so oxygen was given subcutaneously in the pectoral region; 4 or 5 litres were given this way. It was absorbed quickly, averaging one and a half to two hours. The improvement in colour and quieting of restlessness were marked. It could be given three times daily this way.

In the hope that oxygen would be taken up by the gastric mucosa I gave hydrogen peroxide as before mentioned, and also considered giving it intravenously, but was afraid of embolism from any effervescence set up.

2. Rest. This was absolutely necessary and the patients had to be watched very carefully. If they got up it was certain to retard progress and some times result in death. Morphine was given only in very restless cases, as we preferred to get rest and sleep by oxygen and stimulation.

Rest of the lung itself was the hard thing to get, but we tried to do it by getting oxygen in by other channels and so avoid pushing pure oxygen on to destroyed alveoli and ruined mucosa.

3. Relief of heart. Rest was the main aid. Next was venesection, and though it was done in only one case and though the patient died ultimately, the improvement in comfort and colour led me to think it would be the best thing for cyanosed cases or where the heart was dilated. Not more than ten or twenty ounces should be taken for fear of weakening the patient too much.

As far as drugs were concerned we used camphor, caffeine, digitalin, and strychnine. Camphor was my personal choice on account of its being excreted by the lungs and so helping these. Caffeine as well as being a good heart stimulant was good for the

mental condition. No advantage could be claimed for either of the other two and digitalin was of less use than strychnine.

4. To relieve lungs, etc. Rest was a first consideration. Outside of oxygen there were several drugs to be used. Atropine had been used in previous gas attacks, but on thinking it over it seemed ridiculous to dry up an already thick viscid mucoid secretion which was better away. Again, if one was going to give emetics or expectorants, atropine would only act against these. Also any one who has had the dry burning sensation in the throat caused by atropine would think twice before adding it to the similar one felt by gassed cases.

We gave very few emetics, but used expectorants such as "The Major's" mixture of potassium iodid and ammonium carbonate. This gave good results.

These were the notes I had made at this time. A few days afterwards pamphlets came giving the French methods. They embodied similar conclusions to those we had arrived at. A drug they advised was sparteine, but I could see little advantage in this unless the kidneys were inactive.

Between this and the next gas attack in our section we received about six cases who had been gassed on the 30th, but kept at duty till forced to stop. Several had dilated hearts, one especially having an increase of nearly an inch each way, with obliteration of cardiac angle. He was suffering from dyspnœa and weakness.

The next series came in on June 17th. Between 8.30 a.m. and 8.30 p.m. six hundred cases were admitted. Of these four hundred and twenty were gassed and nearly three hundred were stretcher cases. One case was dead on arrival and one died while being admitted.

These cases all were of the pallid or leaden hued variety. There were a few cyanosed cases, but they were not the dusky red cyanosed type seen in the attack of May 30th. We noticed that a number had the lips covered with froth. This was a bad prognostic sign, all of such cases dying, mostly the first day.

All the severe cases were put out of doors and we began treatment as outlined before. All oxygen tanks available were got to work, the severe cases being given inhalations as often as possible. Camphor hypos were given all severe cases and also to many moderately bad ones. Hydrogen peroxide, one drachm every hour, was given to nearly three hundred cases. I bled four cases at once, and gave oxygen subcutaneously to about fifteen or twenty. A few of the restless ones got morphine gr. $\frac{1}{4}$ hypodermically, and three or four

cases were given atropine gr. 1–15 hypodermically. We induced vomiting in some and a number vomited spontaneously. In either case great relief resulted. Notwithstanding the use of all methods I could not see that much good resulted in the very severe cases. Seventeen died during the day, all from œdema of the lungs. The amount of fluid in the lungs was so great that many patients could be turned on the side and large amounts of yellowish serum expressed, almost a quart at a time in some. Captain Selby saved several cases in this manner.

In the morning we sent three hundred cases to base, keeping a hundred very bad ones. We kept up treatment as before. The agony suffered by this group of cases was intense and the scene was the most gruesome one could imagine, whilst the sounds of suffering were horrible, and the evidently hopeless outlook for so many of them made it most discouraging for us. One would be at one end of the ward, give some orders about a patient, go to the other end of the ward, then get called back to the first patient, and get there in time to see a gush of froth and serum followed by death in a moment or two.

During the 18th, the same course as before was followed. About four more cases were bled, and some fifteen cases got oxygen subcutaneously. Having heard from Captain McLean that gases were readily absorbed by the rectum, I tried giving oxygen this way to several cases. These various methods would relieve symptoms and keep them going for a time, but ultimately the result would be the same in too many cases. There would be the gush of froth and fluid, followed by death in a few moments. During the day twenty died, one from cardiac failure, the rest from œdema of the lungs. We sent forty-six to base.

On the 19th five died, twenty went to base.

On the 20th, two died and we evacuated eight.

On the 21st, we sent our last patient down.

Now between these cases and those of April 30th the differences lay in this—the cases were all of the pallid type. They all showed œdema of the lungs. The secretions from the lungs instead of being viscid and mucoid were thin and serous. Thinking I might get some free fluid in one case, I did a paracentesis, but got nothing.

It was on doing the autopsies that the uselessness of any method of attempting to save those dying could be seen. We did fifteen autopsies. The findings were practically the same in all. The base of the tongue was blue and dark. Epiglottis, larynx,

and trachea intensely congested, much more so than the first series and covered with frothy mucus. Bronchioles filled with serous fluid. There were punctate hæmorrhages under the visceral pleura, but few of the bullæ seen in cases of April 30th. Every case showed lungs œdematous from apex to base with practically no sound tissue. The lungs weighed from three to four times normal. On section they exuded froth and serum from every point. Over twenty ounces could be easily expressed from one lung. The cases dying early showed very little inflammation, which was more evident the longer the case had lived. Cases dying later showed hepatization almost and marked friability of tissue. The last patient dying had almost liver-like lungs, and oozing of bloody serum.

In a few cases the heart was dilated. The stomach in all showed marked congestion of rugæ especially along the greater curvature, and sometimes more so towards the pylorus. In one case the liver was markedly congested and in one the spleen was congested also.

In the brain, the choroid plexus was greatly congested and there were numerous petechiæ throughout the internal capsule.

After this last attack, I had no opportunity of seeing other severe cases. A number of such went through the clearing station north of us in July and from accounts they seemed to be of the nature of those seen in the attack of June 17th. Results of treatment were about the same and the conclusion one had to arrive at was that no one method could be followed, but that combinations of means used as mentioned would save a certain number. The one thing impressed on all was the imperative need of absolute rest.

I must before closing express my indebtedness to Lieutenant-Colonel F. S. L. Ford, C.M.G., in affording me every help and encouragement in attending and studying these cases.

ON THE MODIFICATION IN THE STRENGTH OF THE BORDET-WASSERMANN TEST DURING THE TREATMENT OF SYPHILIS*

By H. K. Detweiler, M.D.

Senior Research Fellow; Lecturer in Bacteriology, Faculty of Medicine, University of Toronto

IF the treatment of syphilis involved alone the problem of causing the disappearance of the outward manifestations of the disease, the task would be comparatively simple. Even before the advent of salvarsan, clinicians usually experienced little difficulty in accomplishing, in the average case, a marked clinical improvement by employing mercury and iodide of potash. With the newer drug the results are often marvellous, inasmuch as under its influence the most extensive lesions frequently disappear in an incredibly short time and the patient apparently is quite well.

It is not difficult, therefore, to understand how even such an illustrious authority as Hutchinson,[1] should have regarded mercury as a satisfactory and sufficient therapeutic agent. It was not until the discovery by Bordet and Gengou of the antigen-antibody reaction and its application to syphilis by Wassermann in 1906, that we possessed a scientific means of checking the efficiency of our method of treatment. It is not yet fully realized by many clinicians that while this test is invaluable in the diagnosis of lues, it finds an equally wide and important field of application in following the progress of the case after the diagnosis has been made and treatment has been instituted. It was not without a considerable degree of concern and even alarm, that the medical profession was informed by this laboratory procedure that in many cases of so-called cures, the disease was far from being eradicated. All statistics regarding treatment had thereupon been rendered out of date and to a large extent useless, and there was ushered in a new era of investigation into the efficiency of the various methods of therapy.

There has appeared since that time a great mass of literature

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Read at the annual meeting of the Canadian Medical Association, Montreal, June 15th, 1917.

*A contribution from the Department of Medical Research, University of Toronto.

dealing with the effect of treatment upon the strength of the Bordet-Wassermann test. Generally speaking, it is now conceded that the progress of the treatment is gauged most accurately by this test and a cure is not claimed until the test has been consistently negative for some time without treatment. So far as these points are concerned the question may almost be considered a closed one. The reason for the investigation here recorded is the fact that many physicians become very pessimistic regarding treatment, after receiving from the laboratory several reports, at reasonable intervals, indicating no change in the test even after prolonged treatment.

This fact in itself is exceedingly significant but it becomes more so in the light of recent revelations in regard to the prevalence of the disease. In the first three months of this year the test has been made on thirteen hundred and thirty-six new patients entering the public wards of the Toronto General Hospital. These patients were not selected, but the test was made as a routine measure, regardless of the condition for which the patient was admitted. This figure includes all types; surgical, medical, obstetrical, gynæcological, as well as diseases of the eye, ear, nose, and throat. Of the thirteen hundred and thirty-six cases, no less than one hundred and sixty yielded a positive test—amounting to 12 per cent. In the out-patient department, in the same three months, two hundred and fourteen new cases were investigated and of these seventy-eight, or 36 per cent., had syphilis. These, however, were not done as routine, but the figures serve to illustrate the alarming prevalence of the disease, for they bring the total new syphilitics discovered at the General Hospital in three months to two hundred and thirty-eight. Furthermore, we have found[2] that the majority of these cases are not suspected of having the disease.

Many cases of syphilis respond readily to treatment—the symptoms disappear, the test becomes negative and the patient is in all probability cured. There are, however, a great number which do not show any change in the test, or do so only after a very long and vigorous course of treatment. Out of a large series of cases in the special treatment clinic, 43 per cent. under careful treatment have shown no change in the test. This percentage is startling, and forms the *raison d'être* of this investigation.

For some time past I have felt that we should know what is going on in these cases during the period of treatment. Are they really receiving no benefit from the administration of antisyphilitic remedies? It seemed reasonable that were one able to make a more

delicate test of their sera, a change might be detected even in these apparently intractable cases. In examining the literature we found no report of such work having been done. McIntosh and Fildes[3] give one or two protocols of cases in whom the sera were titrated somewhat in the manner herein described, but their attention was directed to patients who respond readily. Craig[4] made dilutions of serum down to 0·02 c.c. in untreated cases, every day for a week, and found that the strength of the reaction varied slightly from day to day, but in the main his results showed that with repeated tests, the variations are negligible save in cases which apparently did not have a very strongly positive test at any time. Such instances in untreated syphilis are, in our experience, due to differences in the antigen, or as suggested by Haller[5] to variations in the hæmolytic system. The latter author's findings are remarkably constant. Recently King[6] reported results of the quantitative test after treating with salvarsan. In this communication he concludes that little change occurs in the strength of the Wassermann reaction during the first five days following the administration. He also makes the rather general statement that "some previously untreated cases may be given prolonged salvarsan therapy with very little weakening of the Wassermann reaction." He adds, however, that they may show striking improvement clinically. We shall take occasion to discuss these statements after presenting our experiments and exhibiting the charts pertaining thereto.

Technique. In our laboratory a cholesterinized heart antigen and an anti-sheep hæmolytic system are used. Ordinarily we use three dilutions of the patient's serum—0·2 c.c., 0·1 c.c., and 0·05 c.c. This gives sufficient information for the regular routine test. Many laboratories use only one dilution—0·1 c.c. For the purpose of this investigation new cases were chosen, i.e., cases that had never before been treated for syphilis, and they were taken in order as they came to the out-patient department of the hospital. The number is not large, considering the size of the clinic and the fact that they extend over a period of five months, but many factors come in to disturb an otherwise ideal field. For example, many cases have previously received desultory treatment. Many leave the city before the investigation is completed. Others find their clinical symptoms clear up, and then, despite the warning of the physician that the disease is not yet eradicated, and the visits of the social service workers in an endeavour to keep them interested in their own cases, they fail to return. The Wassermann test is

made before treatment is begun, and then, with few exceptions, every time the patient returns for treatment a sample of blood is taken just before the treatment is administered. This means that the majority have a weekly test. The same antigen is used throughout the series. The serum in all cases is diluted so that the small amounts to be used may be accurately measured. Seven tubes beside the serum control, are used for each case, and they contain 0·2 c.c, 0·1 c.c., 0·05 c.c., 0·025 c.c., 0·01 c.c., 0·005 c.c., and 0·0025 c.c. of the patient's serum. The control tube contains 0·4 c.c.

It may be well, at this point, to describe briefly our method of recording results, as it differs from any we have yet seen. The result in each tube in the test is represented by a number. The figure 4 means no hæmolysis has occurred in that particular tube; 2, means that 50 per cent. hæmolysis has taken place; 1 would, be 75 per cent. hæmolysis, and 0, would be complete hæmolysis. For example, in our routine tests, 4 4 4 means no hæmolysis with 0·2 c.c., 0·1 c.c. and 0·05 c.c. serum. Naturally, when a case begins to show the effects of treatment it is the third tube which goes first since it has the smallest quantity of serum. In this investigation there are seven figures which indicate exactly what the technician sees in each tube, so that by this method the reader can gain almost as vivid a picture of the result of the test as the one who performs it.

Results. At this date our results are necessarily slightly incomplete, but sufficient information is at hand from which to draw certain definite and fundamental conclusions which will prove of interest and profit to the physician who treats this disease. There are seventy-five cases in the series. Of these five are congenital; ten are in the primary stage; twenty-four in the secondary stage; twenty-six tertiary and four latent. In six the stage is not known.* These seventy-five cases were taken consecutively as they presented themselves at the clinic, the only restrictions exercised in their selection being that they must have a strongly positive Wassermann test to begin with and must never have had treatment for syphilis before.

Of the seventy-five cases, eighteen have become negative. Of these, two are congential, five secondary, four tertiary, while

*Owing to the lack of a clear line of demarcation between the different stages of syphilis, the above classification is necessarily arbitrary and only approximate. "Primary" means the presence of a chancre. "Secondary" the presence of a rash, sore throat, mucous patches, condylomata, etc. "Tertiary" means the presence of gummata, vascular changes, etc.

one was a case of latent syphilis. The average amount of treatment required to produce these negative tests was five doses averaging 0·5 grams of diarsenol.

Of the seventy-five cases sixty have definitely improved from a serological standpoint, leaving fifteen unimproved. In analyzing the fifteen I find that only seven of them had more than two injections of diarsenol; one of the seven had only three injections, while of the six remaining, one is a congenital case, and five are old tertiaries.

Discussion. It is impossible to compare our results with those of any other investigator, because of the lack of parallel experiments. King probably comes the nearest to our field of work, but he observed his cases over a very short period of time—five days. He concludes that very little change occurs in the strength of the Wassermann test as the result of a dose of salvarsan. In looking over his protocols we find that three cases out of twenty show a definite weakening of the test, and while ours show a higher percentage than this, we agree to a certain extent with his contention that it takes more than one dose to produce a marked effect on the alexin-fixing substances. It was a serious mistake at the beginning of salvarsan therapy to assert that one dose, or at the most two, would be sufficient to cure. It is not surprising to find the laity reluctant to discard this hope, in view of the fact that the symptoms and lesions often clear up rapidly, but that many of the profession should also be slow to acknowledge its fallacy is indeed a matter of concern, for it is surprising how many still treat syphilis without calling in the aid of the laboratory to ascertain the progress of the case.

The charts are shown with the view of impressing upon our minds the optimistic outlook in treating syphilis. What we wish specially to bring out is the fact that in nearly every case, long before the ordinary Wassermann test shows any sign of being affected by the treatment, the more delicate titration of the serum herein described gives unquestionable evidence of benefit. This is well shown in a graphic manner in the charts appended. These charts are type cases and serve to illustrate our contentions in a much less laborious manner than that of writing out in full the experiments undertaken. Besides the charts, there are several examples of actual protocols. These are included not because they are essential to the full report of a case so much as because they serve to illustrate our method of recording the strength of the test by figures representing the degree of inhibition of hæmolysis.

Among the cases which have not responded to the treatment, there seems to be no real cause for pessimism save in a very few instances of long standing tertiaries. Even these may show decided improvement before the treatment is abandoned. None of them have had more than eight doses of diarsenol and there are very few clinicians who would consider that number a fair test of a therapeutic measure. This view is based on practical experience, for we have seen many instances where the patient required more than twenty doses to produce a change in the Wassermann test.

Conclusions. 1. The serological improvement in the blood of cases of syphilis is often not indicated in the ordinary Bordet-Wassermann test. In this series 43 per cent. showed no improvement.

2. By titrating the sera as described under "Technique" such cases, in nearly every instance, can be shown to have definitely improved, often after only one injection.

3. These findings constitute a strong justification for persistence in treatment of so-called "refractory" cases.

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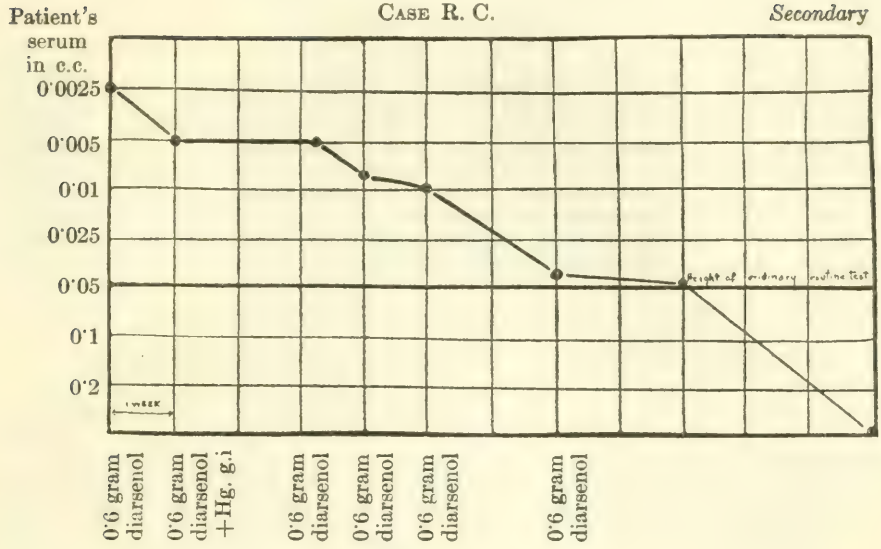
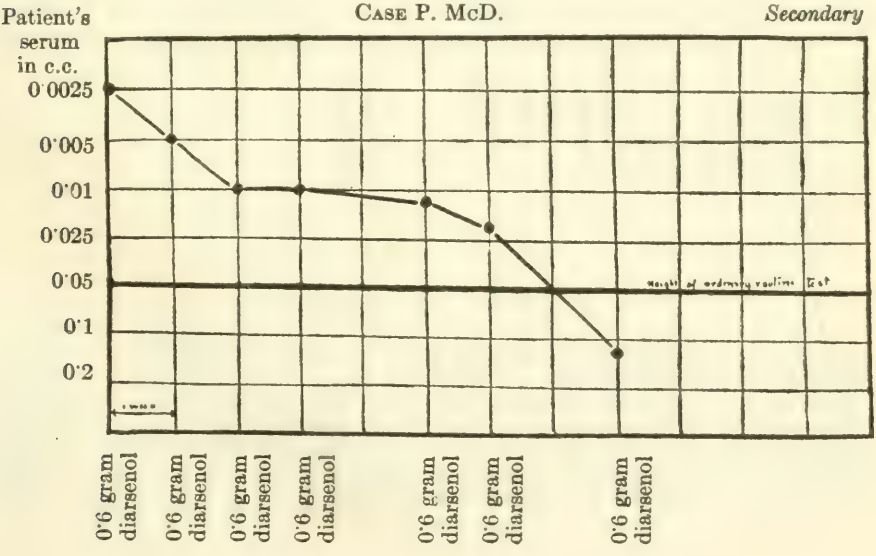


R. C.....Secondary

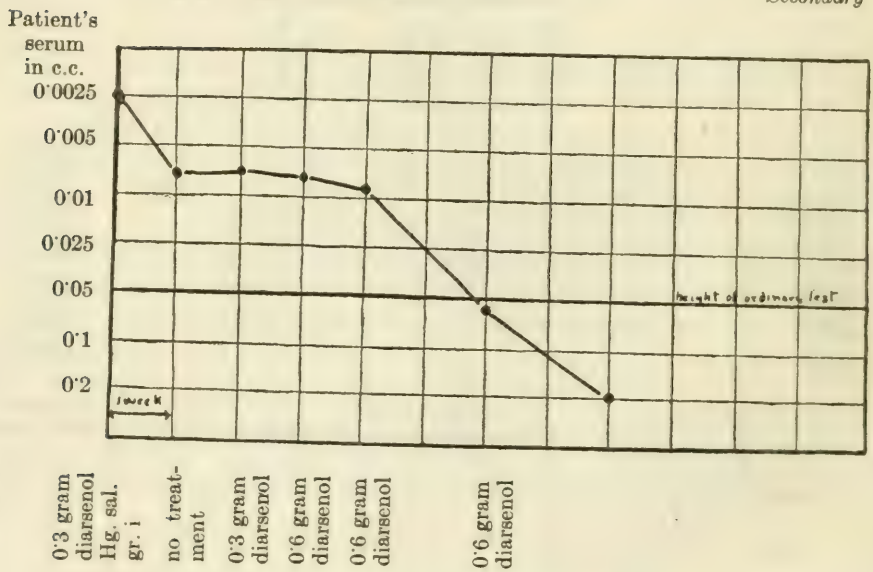
January	24....	0·6 grams diarsenol, Wass. before treatment.....	4444444
February	1....	0·6 grams diarsenol Hg. g.i, Wass. before this treatment..	4444440
February	19....	0·6 grams diarsenol, Wass. before this treatment.....	4444440
February	22....	0·6 grams diarsenol, Wass. before this treatment.....	4444410
February	26....	0·6 grams diarsenol, Wass. before this treatment.....	4444400
March	7....	0·6 grams diarsenol, Wass. before this treatment.....	4441000
March	21....	0·6 grams diarsenol, Wass. before this treatment.....	$444\frac{1}{0}000$
April	18....	.....	0000000



P. McD.....Secondary

January	17....	·6 grams diarsenol, Wass. before treatment.....	4444444
January	24....	·6 grams diarsenol, Wass. before this treatment.....	4444440
February	1....	·6 grams diarsenol, Wass. before this treatment.....	4444400
February	7....	·6 grams diarsenol, Wass. before this treatment.....	4444310
February	19....	·6 grams diarsenol, Wass. before this treatment.....	4444300
February	22....	·6 grams diarsenol, Wass. before this treatment.....	4444100
March	7....	·6 grams diarsenol, Wass. before this treatment.....	4300000
March	21....	Hg. Sal. Wass., before this treatment.....	3330000
June	13....	Hg. Sal. Wass., before this treatment.....	1100000

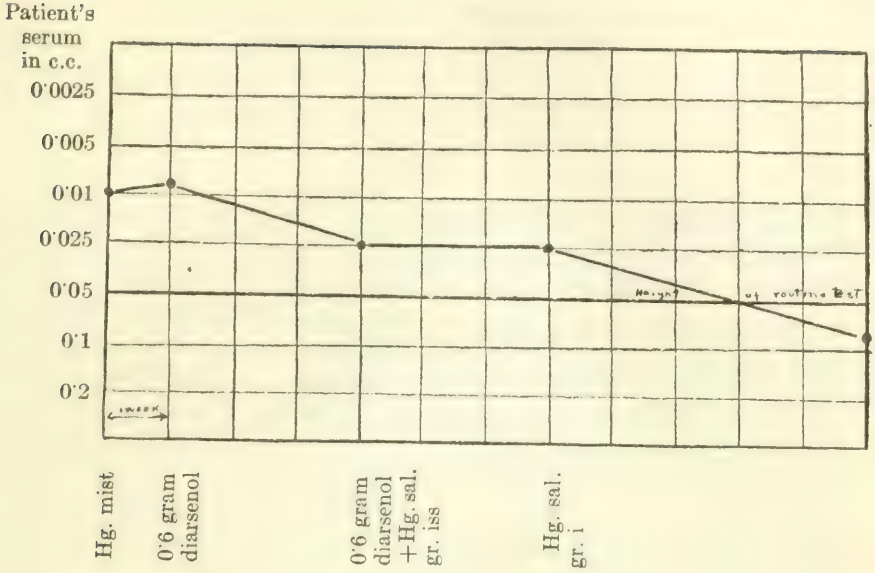
CASE L. McD. *Secondary*



L. McD.....Secondary

January	24....	0·3 grams diarsenol, Hg. gr.i. Wass. before treatment.....	4444444
February	1....	No treatment.....Wass.....	4444420
February	7....	0·3 grams diarsenol, Wass. before this treatment.....	4444421
February	14....	0·6 grams diarsenol, Wass. before this treatment.....	4444420
February	22....	0·6 grams diarsenol, Wass. before this treatment.....	4444410
March	7....	0·6 grams diarsenol, Wass. before this treatment.....	4430000
March	21....	Hg. Sal. gr. i, Wass. before this treatment.....	1110000

CASE M. L. *Tertiary*



M. L.....Tertiary

November	10	Mixed treatment, Wass, before treatment	4444400
November	18	·6 gr. diarsenol, Wass. before treatment	4444410
December	11	·6 gr. diarsenol+Hg. Sal. gr. iss, Wass. before this treatment	4444000
January	4	Hg. Sal. gr. i, Wass. before this treatment	4444000
April	18	Hg. Sal. gr. i, Wass. before this treatment	4410000

EMPYEMA CAVITIES

By D. E. Robertson, M.B.

Toronto

In the winter of 1913-1914 the writer began to employ Beck's bismuth paste in empyema cavities, in order that the outline might be recorded by means of stereoscopic radiographic plates. A series of cases was treated in this manner; the patients for the most part had suffered from a discharging sinus for six months or more following a rib resection for empyema. Other cases, again, were followed from a few days after operation and their cavities registered in an *x*-ray plate. In this way, at certain periods, bismuth paste was injected into cavity and any change in size was readily demonstrable. By taking a stereoscopic plate the exact outline and position of the cavity was obtained. It was hoped, that by having an absolute record it would be possible to judge definitely the effect of treatment and the progress of the case, as evidenced by the diminution of cavity.

The cases studied were those that show the usual bacterial flora common to this condition. In no case was there a tuberculosis underlying and primarily the source of the condition. None of the cases had osteomyelitis of rib.

The plates to be shown are of patients who can be divided into *two* classes. *First.* Those whose sinus and discharge were cured in about two months after a rib resection. These were filled with bismuth paste for skiagraphic reasons only so that diminution of the cavity might be followed. No claim whatever is made for bismuth paste as a therapeutic measure.

Second. Those cases that had become chronic or had taken well over two months to heal; in fact some were not healed two years after the primary operation. In two such cases a modified Estlander operation had been done in the hope of obliterating the cavity by means of a collapse of the parietal wall of the sac. The operation consisted in exposing four or five ribs covering the cavity, and after splitting and reflecting the periosteum, three inches of the

Read at the forty-eighth annual meeting of the Canadian Medical Association, June 14th, 1917.

rib was peeled out. This was sufficient to permit of a considerable collapse of the parietal wall.

Early in the series the point of drainage presented itself very strongly. It must be remembered that the chronic cases are ambulatory ones and consequently were erect for more than half the day. These patients when operated upon had the opening made well back in the post axillary line, or behind this even. The drainage is therefore good, while they are lying on their backs, but when they are allowed to sit up or to be out of bed, the drainage is not good. I shall with lantern slides, endeavour to demonstrate the two classes of cases, showing the second class first, *i.e.*, the chronic cases.

One word about the technique of filling with bismuth paste. To get a heavy shadow a 50 per cent. bismuth and vaseline was required. This must be warmed to use in a glass syringe. In the earlier attempts the cavity was not completely filled; the cavities were not expected to be so large, and there was not sufficient paste put in.

The negatives have been made from stereo plates and in showing them on lantern slides one loses the valuable stereoptical effect.

Case 1. I. P., æt. seven months. Rib resection in January, 1913.

No. 1—5071. April 23rd, 1914. One year and three months later *x*-ray shows a cavity with drainage at upper end. Three days after this plate was taken portions of two ribs overlying the cavity were removed. The sinus and cavity were swabbed out with alcohol in an endeavour to sterilize if possible the walls, and permit healing to take place now that the parietal wall was collapsed.

No. 2—5638. August 17th, 1914. Four months after previous operation there is existing a cavity that is larger than formerly. The opening is at the top of it. The operation done in this case was therefore of no value whatever. Here the collapse of the parietal wall did not cure and swabbing out of cavity gave no success.

This case shows also that all the original cavity above the present opening has closed, and that the only remaining part lies below the opening.

Another attempt was made to close the sinus in October, 1914, but was unsuccessful, as the history shows there was still discharge in March, 1915, one year and nine months later.

Case 2. P. R., æt. eleven. Not a chronic at first but demonstrates bad drainage.

No. 3—4740. February. Two days after operation. Drainage in upper part of empyema.

No. 4—4871. March 11th. Five weeks after operation. Drainage in upper part of cavity. The cavity is hour glass. There was not sufficient bismuth put in as it afterwards proved.

No. 5—5414. June 18th. Here the cavity was completely filled and is an enormous affair. Drainage bad. Patient was taken home by father.

Case 3. W M., æt. nine. One year and four months since operation.

No. 6—4265. Large cavity drainage at seventh rib. Operation with removal of ribs over cavity to permit of collapse.

No. 7—4449. December 3rd, 1913. Section of 3rd-9th ribs removed. Drainage tube in place.

No. 8—4574. January, 3rd, 1914. One month after operation for collapse of parietal wall. Regeneration of ribs and in line of new contour of the chest wall.

Two months after operation, small amount of discharge from sinus. No further history. This was a long standing case and had bad drainage.

Case 4. M. M., æt. four years. Operation September, 1914. Fifteen months later two ribs resected.

No. 9—8972. Taken five months later. Operation was not sufficient to cure. Cavity was from 7th to 10th ribs. Portion of 7th and 8th ribs resected. Proper drainage not arranged. Again demonstrates collapse not sufficient to effect a cure.

Case 5. G. P., æt two years. Operation January, 1915.

No. 10—7784. Nine months later. Cavity 3rd to 10th rib. Drainage bad. No further history.

Case 6. J. L., æt. two and a half years. Operation April, 1912.

No. 11—5296. May 29th, 1914. Two years and two months after operation. Cavity from 7th to 10th rib, opening at 7th rib. Drainage bad.

No. 12—5437. June 23rd, 1914. 5th and 9th ribs resected with lower drainage provided. Discharged cured one month later. This case was cured in very short time after the combination of collapse of parietal wall and lower drainage.

The above conclude the chronic cases to be shown. There now remain the cases that healed quickly and required no surgical interference.

Case 7. M. C., æt. two years.

No. 5—An enormous cavity—drainage is from point midway up.

No. 16—Illustrating a cavity, the drainage exit of which is at the most dependent point of cavity.

No. 13—4644. Taken one month after operation. Cavity 4th to 7th rib and lying toward anterior axillary line. 7th rib resected. Good drainage and cured in seven weeks from operation.

Case 8. M. Mc., æt. four and a half years.

No. 14—4964. January 26th, 1917. Cavity extends from 4th to 7th rib. Drainage through 7th rib. She gets well promptly.

Case 9. B. S., æt. eleven months. Operation April 22nd, 1914.

No. 15—5277. May 28th. Taken one month after operation. Cavity extends from 6th to 7th rib. 7th rib resected. Good drainage, and is cured in six weeks from operation.

Case 10. J. C., æt. twenty months.

No. 16—5072. One month after operation cavity from 5th to 9th ribs. Drainage through 9th rib which is lowest point.

No. 17—5279. One month later. Cavity much smaller. Cured two weeks later. Ten weeks in all.

Case 11. E. K., æt. two years. A lung abscess.

No. 18—5387. June 15th, 1914. Shows chest before operation. Diagnosed empyema, and a needle got pus.

No. 19—5409. June 17th, 1914. Drainage into lung abscess through 9th rib post axillary line.

No. 20—5444. June 25th, 1914. Shows cavity and the bronchial tree. In August absolutely closed.

No. 21—5637. August, 1917. A little thickening.

These cases comprise all that have been filled with bismuth at the Hospital for Sick Children. More cases have not been done on account of the war interfering in 1914. This also accounts for some of the class (two cases) not being followed longer.

In the first six plates shown it may be observed that the drainage was not well placed; that is to say that the pocket extended below the aperture of exit. This class extended over a long period of time. The first plates of each case shown were taken fifteen months, sixteen months, fifteen months, nine months, and twenty-six months, after primary operation. The last five cases shown (Class 1) were on the other hand, cured in about two months at the longest; and in these the plates show the persisting cavity lying above the aperture for drainage. At the primary operation the drainage was established at the lowermost point in the empyema.

In conclusion, it would appear that the most important point in the treatment of a non-specific empyema cavity is the proper drainage thereof; that if the pus is allowed to drain off as soon as formed, granulation will fill in, in spite of the fact that there is infection of the wall of the sac.

HOME TREATMENT OF TUBERCULOSIS

By D. H. Bernstein, M.D.

Montreal

THE present method of treating tuberculosis has many disadvantages. The ideal method of treating tuberculosis is in sanatoria, but there are not enough institutions to accommodate all persons suffering from the disease.

According to the latest reports from the "National Association for the Study and Prevention of Tuberculosis" there are in the United States about one million persons suffering from tuberculosis, while there is accommodation in sanatoria for only forty-five thousand patients. These institutions include accommodation for incipient and advanced cases, children's hospitals, almshouse hospitals, hospitals for insane patients, and for patients in penal institutions. There is therefore accommodation for only 4·5 per cent. of the patients suffering from tuberculosis, the remaining 95·5 per cent of persons suffering from the disease have to be treated outside.

Since living conditions in Canada are similar to those in the United States, it is safe to assume that the proportion of persons suffering from tuberculosis is the same. Assuming that the population of the United States is one hundred million, we find that one per cent. of the population is suffering from tuberculosis. If we assume that the population of Canada is eight million and the same proportion of the population is affected with tuberculosis, we must have at least eighty thousand persons affected with the disease in Canada. According to the last report of the "Canadian Anti-Tuberculosis Association" there is in Canada accommodation in sanatoria for eighteen hundred and five patients. This shows that only 2·25 per cent. of tuberculous patients are accommodated in sanatoria in Canada, the remaining 97·75 per cent. of the patients have to be treated outside of institutions.

In Montreal there were in 1915, 1,062 deaths from tuberculosis and as this number would represent one fifth of the number suffering from tuberculosis there are therefore at least 5,310 persons

Read before the Montreal Medico-Chirurgical Society, June 1st, 1917.

affected with tuberculosis in this city, not counting the number found in our suburbs. The number of patients that can be accommodated in sanatoria in the whole province is one hundred and sixty-five, it follows that more than five thousand patients must be treated outside of sanatoria in Montreal alone. A small number of these patients may be in a position to go to a health resort where they find expert medical treatment as well as proper accommodation so that they are as well off as in sanatoria. But when one remembers that the treatment for tuberculosis is a long drawn out affair lasting months, it is self-evident that only a few patients are in a position to stand the necessary expense which is usually much higher than in sanatoria. We are therefore still confronted with the problem of how to treat the vast majority of patients, perhaps 90 per cent. of those affected with tuberculosis.

While at present both physicians and laymen agree that the treatment for tuberculosis consists in fresh air and plenty of food, yet both physicians and laymen when they speak of fresh air mean country air. Therefore when a physician diagnoses tuberculosis in a patient, if he cannot find room in a sanatorium, he sends his patient to the country. As I have shown above that about 90 per cent. of the patients find that the health resorts are too expensive, they must perforce live in cheap country boarding houses, and very frequently without any medical advice. Usually the city physician gives the patient a little general advice or no advice at all, leaving it all to the patient's common sense. We all know what common sense amounts to without knowledge. Disastrous results follow. During the summer months one is able to get fair board and accommodation for a moderate price. Patients will then go to the country and be out in the open air as much as possible, but instead of taking the cure they take long walks, climb the highest mountains in the neighbourhood, take a swim twice a day, go rowing and take part in many games. At the end of three months they come home and wonder why they did not gain either in weight or strength.

Those of the patients that are sent to the country during the winter are most of the time obliged to stop in farm houses without proper sanitary arrangements. The food while simple and nourishing is without variety and while it may be possible to "rough it" for a while, a person who is accustomed to a variable diet, and particularly the tuberculous patient, who as is well known readily develops fastidious tastes for food, soon tires of the country. As a result of lack of proper accommodation and absence of personal

comfort, together with improper diet and the monotony of country life, the patient becomes fretful and finds that his stay is not doing him any good. Consequently he returns to the city.

All these patients on returning to the city go back to work and work as long as they can; in the meantime the disease is advancing and at the end of five years, most of them will have died of tuberculosis.

There is still another class of patients, who cannot afford to go to the country. These people neglect to take the treatment or cure entirely, feeling that as they cannot get the fresh air, meaning the country, they will not get cured, and as the general practitioner in the city holds the same opinion, no attempt is made to remedy matters, the result is that these patients pass from one stage of the disease to another until they are finally landed in an incurable hospital. The final result is that one person out of every eight dies from tuberculosis, a distinctly curable disease. To quote Commissioner Biggs, "No disease is better understood or more preventable and none more amenable to simple and easily applied measures."

If one were treating a case of typhoid fever and if he could not obtain accommodation in a hospital for his patient, he would not send such a patient to the country without provision for proper accommodation as well as proper medical treatment, but would treat such a patient at home and expect nearly as good results as from hospital treatment. Then why treat tuberculosis differently, since when properly treated at home good results can be obtained? But in order to obtain good results patients must be treated at home the same way as they are treated in sanatoria.

All patients with a well-marked tuberculous lesion presenting themselves for treatment show certain common features, namely, loss in weight, asthenia and a feeling of lassitude, other symptoms may or may not be present. This shows that we are dealing with a body that is underfed and over worked These terms I am using in their broadest sense, inasmuch as the rich man who finds no time to eat is as much underfed as is the poor man who starves. The remedy for this condition is self-evident, namely, Rest and Food. In order to stimulate bodily functions and bring them into a normal state we give the patient as much fresh air as possible. When the patient's weight and strength have improved sufficiently, graduated exercise is prescribed It follows that the treatment for tuberculosis consists of rest, food, fresh air and exercise, in the order of their importance.

Rest. At the outset of the treatment for at least one month or six weeks, patients are required to rest the whole time, either in bed, day and night, or in a reclining chair during the day. The length of time depends on the temperature, pulse rate and the rapidity with which a patient regains his usual weight. It is useless to attempt forced feeding in a febrile patient who is not at rest. When a patient is sent to the usual boarding house in the country he cannot rest, for no boarding house keeper will take a sick boarder nor will the other boarders tolerate a sick person in the house, especially if it is known that the patient is tuberculous, therefore staying in bed is out of the question. Using a reclining chair is also not permitted in most boarding houses, even in so called health resorts, consequently the patient has to sit in an ordinary chair, which is very uncomfortable and even tiresome for a weak person. Most of these patients always try to give the appearance of well-being with disastrous results. Therefore for such patients home is the only place where proper rest can be obtained. Nearly every house has a front or back porch where the patient can stay most of the time, one can use a couch or a reclining chair and in the summer time a hammock. At home the patient can be kept under control by the family as well as by the family physician. The family will attend to the comforts of the patient. In order to obtain good results one must not neglect the little details that make a patient comfortable when he has to rest all the time. The porch must be so arranged that he will be protected against the sun, winds, and rain. Patients are usually shy about being observed by the neighbours. Prying eyes can usually be kept away by rigging up a curtain or porch blinds.

Food. The question of food is of paramount importance in connexion with tuberculosis. It may seem paradoxical but while food is raised in the country, better and cleaner food and greater variety is obtained in the city and in many cases much cheaper. The prevailing tendency among medical men as well as laymen is to overfeed the patient. But why one should expect that the stomach of a tuberculous patient should be capable of holding more food than that of a healthy man is beyond comprehension. We all know the results of overfeeding in health, the results of overfeeding in tuberculosis are even more disastrous. While superalimentation is practised in connexion with the treatment of tuberculosis, it must be followed out with great caution. The best plan is to give the patient three meals a day of good substantial and well-prepared food at five hour intervals. Two and

a half hours after a meal is taken, if a glass of milk or a raw egg is given, gastric digestion will not be interfered with and at the same time the stomach will have emptied itself before the next meal time arrives. In this way the stomach will not be overloaded, thus avoiding the resulting consequences of an overloaded stomach.

Fresh Air. Fresh air is about the only vital substance that can not be monopolized and can therefore be had everywhere free and with but slight effort. Yet few persons in any community make any attempt fully to utilize the amount of fresh air available. "It has been said that the only bad air in the country is in farmers' houses whence it seldom has an opportunity to escape " (Brown), To blame the city air as the cause of tuberculosis is unreasonable. for the country is not altogether free from tuberculosis, although the number of persons affected seems smaller, yet one must not lose sight of the fact that country people lead a less strenuous life than city people do. Occupation also plays an important part. The effects that a strenuous life as well as occupation have on the production of tuberculosis may be noted by the fact that females are less subject to tuberculosis than males are, even in cities. In the United States the death rate of males was one hundred and forty-nine per 100,000 as compared with one hundred and twenty for females. Density of population does not seem to account for the high death rates, for London the largest city in the world has a death rate from tuberculosis of one hundred and thirty-two per 100,000, only slightly larger than the rural districts of the United States with a death rate of one hundred and fourteen per 100,000. On the other hand all civilized countries have reduced the mortality from tuberculosis during the last fifty years, while the density of the population increased. This changed condition can be explained by the fact that people are beginning to understand the benefits of fresh air and hygienic sanitary measures. That these are the actual causes in the reduction of the death rate from tuberculosis is proven by the fact that while the death rate in cities is constantly decreasing, the death rate in rural districts is practically stationary. This shows that a tuberculous patient has a fair chance of getting cured in the city as far as fresh air is concerned, only he has to take advantage of the benefits derived from fresh air just as it is practised in sanatoria.

Exercise. At the end of several weeks of rest exercise is begun in suitable cases to get the patient into condition. Passive exercise by massage may be begun when the patient is still confined to bed before the temperature is normal and when there is still loss of

weight, but should not be prolonged sufficiently to cause fatigue. Massage should not be carried out when there is marked weakness, hæmoptysis or any intercurrent disease or complication. Doctor Wadsworth says, "Some years ago the treatment of tuberculosis consisted very largely of prolonged rest and over feeding. This has gradually been supplanted by more and more exercise or work for those who are forced to earn a living. In many institutions the statistics show that the quiescent, subacute or latent cases of tuberculosis are in much better health and happier in doing a prescribed amount of work each day. A tuberculous subject is therefore no longer barred from contributing to his own support and is not wholly dependent on the charity of others."

Active exercise should be begun as soon as the patient's condition permits. Exercise means walking and should be discontinued if the patient has fever, rapid pulse, blood in the sputum and loss in weight. As long as these symptoms persist no exercise is advisable. It is wise to begin exercise with a five minute walk each morning and gradually increasing a few minutes each week until the patient is able to spend four to six hours a day on his feet without fatigue. In all cases a patient should rest half an hour before and half an hour after meals (Brown).

Advantages. The advantages of home treatment are many. Treatment can be begun long before there are any urgent signs or symptoms. If one will only realize that the direct causes of tuberculosis are overwork and underfeeding, then as soon as a patient presents himself in a run down state, with loss in weight, weakness and a tired feeling, the proper treatment can be instituted without causing much inconvenience to the patient or his family. This is especially so in connexion with married women who find it hard to break away from home and family. The experience of every medical man connected with a sanatorium is that married women are hard to deal with and make very unsatisfactory patients for institutions. Then there are many whose income ceases when they leave the city, while if they remain at home they can continue to manage their affairs with the help of another member of the family. In such cases it is of vital importance for the patient to remain at home. The other advantages of city treatment are better food, proper sanitary arrangements and better accommodation. Patients are not so lonesome and have the consolation of friends and care of the immediate relations. The members of the family realize that it is to their benefit to take good care of the patient and to see that instructions are carried out. There is another great

factor to include in the beneficial effects and that is the patient is under the direct care of the family physician perhaps aided by a specialist.

Home treatment does not entail any extra expense so that a person of moderate means can stand the financial burden much easier and for a much longer time than is possible when the patient is sent to the country.

We have all come across those cases of so-called neurasthenia with emaciation and weakness who begin to improve and feel better as soon as their weight returns to normal. A large number of those cases who do not improve ultimately turn out to be tuberculous. If we treated these cases as potentially tuberculous we would anticipate the ravaging effects of the disease at a later date. To quote Dr. Landis, "I believe the most distinct advance that has been made in recent years is the increasing conviction that to successfully fight the disease it must be prevented and that little can be expected if we are to depend on treating fully developed tuberculosis".

Method. My method of treating is as follows: I divide all cases into two groups. Group I consists of (a) patients who show loss of weight and weakness but no signs of tuberculosis; (b) cases of quiescent tuberculosis who show physical signs but no symptoms.

Group II. Cases of tuberculosis with symptoms as well as those patients with severe symptoms of intoxication of uncertain origin.

My treatment in Group I consists of having the patients rest for two hours after the midday meal. This can be done by married women and small shopkeepers. Where this can not be carried out I get the patient to stay in bed week ends and I continue this treatment until the weight of the patient is normal for his age and height. Then I enforce two rules. Benjamin Franklin's "Early to bed and early to rise, make a man healthy, wealthy, and wise," and the Biblical injunction, "Work six days and rest on the seventh."

Patients in Group II are treated just as they are treated in sanatoria for tuberculosis. In order to succeed one must pay attention to every little detail in connexion with the comfort of the patient. It is not enough to tell a patient to sleep with his window open but one must give details how to prepare the bed, the room and the patient, one must remember the great variation in the temperature which sometimes amounts to 20–30° in the course of a few hours.

I will just cite a few cases to show the results obtained.

Case 1. Mrs. H., aged thirty-three, married eighteen years, has had five abortions and six living children. I confined her with the last child in February, 1910. Soon after she began to complain of feeling unwell. She made the usual rounds of doctors and hospitals. The diagnosis was always nervousness and neurasthenia. She was fed on bromides for about three years. The diagnosis of tuberculosis was first made in 1913. She was sent to a sanatorium where she remained for five and one half months without any improvement. She then left the sanatorium and stayed in the country for two years, with but slight improvement. I saw her on August 7th, 1915, with the lesion on the right side only. At that time I also thought that the country offered the only chance for a recovery, I therefore advised her to go back to the country. This she did. I saw her again on September 7th, 1916. She was now deaf in both ears, her cough was worse with a good deal of expectoration which was loaded with tubercle bacilli. She was running an occasional temperature of 100° for several months. Her pulse was 90-100 and both lungs were involved, she was losing weight and was very weak. I then told her that she could not possibly be worse off in the city than she was in the country. I therefore advised her to come to the city. She then remained in the city with her family. She began to improve almost immediately.

On September 17th her temperature was normal, cough less, appetite improved. From this time on, she improved steadily, without having had a cold all winter. Her cough stopped entirely and she gained ten pounds in weight. In January she began to do light household duties, something she had not done for years. She was quite happy feeling once more that she was of some use in this world. This patient had a sanatorium training which she carried out at home with good results.

Case 2. Mrs. R., aged twenty-nine, married seven years, has three children. On July 1st, 1915, complained of a lump in her throat worse after eating. Frequent attacks of headache and weakness. Marked anæmia. Her baby was then five months old but she did not nurse it. She did not improve and I did not see her again until October 3rd, 1916. She then had a slight dry cough, marked hoarseness which was getting worse during the preceding eight months. She was unable to raise her voice or sing. She tired easily and had to lie down every little while. Her mother had to do all the housework and look after the children. She lost weight continuously for several months. Her usual weight was

one hundred and twenty pounds and came down to ninety-five pounds. She consulted a throat specialist and other medical men, and was advised to go to the country but could not do so. She had no temperature. Lungs negative but was extremely pale. I put the patient to bed for two weeks. Then I allowed her up, but had her go to bed at nine p.m. and remain in bed till ten a.m. with breakfast in bed, and she rested again for two hours in the afternoon. In addition to her meals she received a glass of milk at ten a.m., at three-thirty p.m. and before retiring for the night. This treatment I continued for four months and on February 1st, 1917, she was able to sing a fairly high note, her voice was clear and felt much stronger. Gained 10 pounds. She is now able to help in the household duties. While this is not a clear case of tuberculosis the treatment seemed to do her good.

Case 3. Miss N. D., aged twenty-three, single. Father and mother died from tuberculosis, has one sister and brother with whom she lives doing the housework.

On March 3rd, 1917, complained of pain in chest, worse on exertion, headache, anorexia, loss in weight, lost twelve pounds, chills frequently, very weak, no cough but sneezed a good deal. Had the grippe two months ago and has been sick ever since. On examination I found a few moist râles in the left apex both back and front and a friction rub at the level of the second rib. Temperature was 99·2°, pulse 90. I applied sanatorium measures at home and she began to improve almost immediately. The fever disappeared and she began to put on weight.

On May 26th she had already put on twelve pounds in weight and the friction rub disappeared although the râles were still present. She was able to do thirty minutes walking without exertion and was able to help her sister who is a dressmaker with some sewing by hand. She feels quite happy that she is able to be of use to her sister again.

I have collected sixty-nine cases, some of which had definite physical signs of tuberculosis, while others just had symptoms such as loss in weight, emaciation, weakness, chills, fever, headache, etc. Some of these having suffered for several months while others suffered for years. In every case where there was loss in weight and marked weakness without definite signs of tuberculosis, and where the cause for these symptoms was obscure, I assumed that they were precursors to tuberculosis and I treated them accordingly with marked improvement in every case where my suggestions were carried out by rest, more or less less according to the case and feeding as well as fresh air and graduated exercise.

Post Sanatorium Treatment. After a stay of several months in a sanatorium the patient is discharged and sent home. Few physicians as well as patients realize the importance of continuing the treatment at home. The patients feel that as they have been discharged from a sanatorium they must be in a fit condition. Physicians are surprised when they examine such patients and find that the physical signs are still present. Very few physicians or patients realize that it takes at least three or four years of treatment to effect a cure.

When one reads reports of sanatoria one finds that very few cures are reported. Therefore the most that one can expect from a sanatorium treatment is to arrest the disease and educate the patient in the treatment. Indeed, Dr. Brown says, "The close supervision of diet, and of exercise for one or two months at the beginning of treatment is probably the chief advantage of the sanatorium." It follows that even sanatorium patients must be treated at home at some time during the course of the disease. It is found that 60 per cent. of the "open cases" still have tubercle bacilli in their sputum on discharge from sanitoria. It therefore is necessary for city physicians to pay more attention to the home treatment of tuberculosis. Dr. Hartfield says, "As an adjunct to each hospital or sanatorium there should be a follow-up department in the hands of a public-health nursing association that should not only visit and correct the defects in the homes of patients who enter the hospitals or sanatoria but should follow these patients on their discharge and should watch over their homes and working conditions."

Summary

To sum up, I will say that:

1. One per cent. of the population is tuberculous and requires treatment.

2. Only 2 to 4 per cent. of the patients can be accommodated in existing sanatoria.

3. Sanatoria do not cure patients, but only educate them to be able to take the cure effectively.

4. The remaining 96 to 98 per cent. of tuberculous patients have to get along without sanatorium treatment.

5. Simply sending a patient to the country without proper provision for his comfort and without proper medical supervision does not benefit the patient. This method incurs unnecessary expense and waste of time, and the patient having no training as

to personal care, is even a menace to those that he lives with by spreading the infection through improper means for the disposal of his sputum, as in most cases the people that the patient lives with are unaware that the patient is tuberculous.

6. That this disease is wide spread is proven by the fact that at least one death out of every eight is from tuberculosis.

Lastly, tuberculosis is a curable disease but must be treated properly and the treatment must be continued to some extent for at least three or four years after the disease is arrested. To accomplish this more attention must be paid to easily applied methods, such as the home treatment offers. To quote Dr. Brown: "Treatment at home is less expensive, does not entail residence in a hotel or boarding house, or acclimatization after return to work, precludes separation from the family and friends, fatigue of travel, homesickness, does not break up business arrangements in the same degree and in fact possesses every advantage but climate." "The value of certain climate has in recent years been called into question and to-day rests largely upon personal belief and experience. Much has been written and little proved."

Finally, to quote Doctor Osler: "The brunt of the battle must be borne by the practitioners at large. The better they know the disease, the better equipped they are to recognize it early, the more intelligently will they appreciate the conditions under which, even in homes, it may be arrested or cured."

We are shocked by the announcement, as this issue of the Journal goes to press, of the tragic death from pneumonia after six days illness, of Professor Theodore C. Janeway of Baltimore, whose brilliant and thoughtful Address in Medicine lives in our memory as one of the chief events of the last meeting of the Association.

Case Reports

PURPURIC MEASLES

By L. M. Lindsay, M.D.
Montreal

THE case was that of a little girl of twenty-two months who had been exposed to measles while recovering from acute lobar pneumonia. Ten days after coryza developed with elevation of temperature; two days later Koplik spots appeared in the mouth, with a temperature of 102°. In another two days she was covered with the typical rash of measles. Three days later the papules over the lower abdomen and thighs became definitely hæmorrhagic, more intense the following day, spreading to the arms, chest and back, so that the whole body was covered with a profuse purpuric rash. There was no increase in constitutional disturbance with change in eruption; on the contrary with the appearance of the hæmorrhage in the eruption the temperature fell from 102.5° to 99°. After three or four days the rash began to fade, but it was nearly two weeks before the eruption finally disappeared from the abdomen. A month later the Social Service reported that she had been perfectly well since discharge. The whole course of the disease was of moderate severity at no time showing toxic symptoms suggestive of malignant measles, no hæmorrhages from nose, bowels or kidneys. The past history was negative save that she had had a former attack of measles, had also pertussis and varicella.

The literature contains very few references to this form of measles.

Ruhrah (in Osler & McCrae) states that petechial eruptions occur in about 5 per cent. of cases, chiefly on the wrists and ankles.

Feer of Zürich says that quite mild cases of measles may show from the onset an eruption with one or many hæmorrhagic spots. He had three cases in one family with general hæmorrhagic eruption, and of mild type.

Quite distinct from this purpuric form is the true hæmorrhagic measles, "Black Measles", which is fortunately quite rare but very fatal. In this form not only are there hæmorrhages into the skin but also from the nose, bowels, kidneys, etc. The patients show symptoms of marked toxæmia, such as high fever, prostration, coma and convulsions, with usually a fatal termination.

Read before the Montreal Medico-Chirurgical Society, June 1st, 1917.

Editorial

THE NEED OF AN ARMY AND NAVY MEDICAL MUSEUM IN CANADA AS A PART OF THE ARMY MEDICAL SERVICE

IN a small handbook by Dr. Arthur Keith* giving the history and describing the salient points of the great War exhibit now going on at the Royal College of Surgeons, which is reviewed at length in the immediately succeeding Editorial, it is especially pointed out that the collection is essentially Imperial in its nature and that it contains extensive material from the Canadian, Australian, and other forces, much of which will be ultimately transmitted to the university or hospital from which the unit collecting it has been drawn, and for which it is in many cases earmarked. From this and other information, we have every reason to believe that the specimens in the collections destined for Canada will reach us before many more months have elapsed. The importance to us here in Canada of such an Army Medical collection, if properly preserved, studied, and displayed, can hardly be over-estimated, and constitutes an opportunity the neglect of which would be a criminal waste. The question presents itself, what provision is to be made for the erection of an Army Medical Museum, one which may fitly accommodate and display the successful results of the British Medical History Committee's generous efforts to secure instructive war specimens for all parts of the Empire? The Canadian Government is already assured, through the Special Canadian Mission, of a finer collection of war material, from the archæological and historical standpoint,

* "A Guide to the Army Medical Collection of War Specimens," by Arthur Keith, London. Republished with the Addresses delivered at the opening of the exhibit in the *Brit. Med. Jour.*, October 20th, 1917.

than is so far possessed by any of the allied peoples. It is essential, in view of the collection already achieved by the Medical History Committee that an Army and Navy Medical Department of equal importance with the rest should be organized; and, like the British exhibit, this should include not merely pathological material, but also hospital equipment, clothing, protective mechanism, war diseases, body parasites, camp hygiene, stretchers, and other means of carrying the wounded.

Such a collection, however, requires special medical knowledge for its organization. No better illustration of this fact can be given than the case of the great Army and Navy Medical Museum at Washington, which was organized through the Army Medical Service of the United States during the Civil War with such monumental success. We understand that the Special Canadian Mission already has the organization of an Army Medical Section under consideration. We submit, however, that the development of a Canadian Army Medical Collection should be undertaken, not as a section of the National War Museums, but, here as in Great Britain, as a part of the Army Medical Service, and by the direct advice and coöperation of experts drawn from the various medical museums in Canada. In this way, undoubtedly, adequate provision can best be made. No better machinery is to be found anywhere for the conservation and display of museum specimens than that which exists in our great Canadian Universities. With the wealth of material secured to us by the Imperial Government, and acting under advice from these and allied sources and within the control of the Army Medical Service itself, it would be easy to construct here in Canada, within the immediate future, an Army and Navy Medical Museum that will well bear comparison with the great institution to the South of us, and that will be at once an aid to our medical officers of to-day and a benefit to those of posterity, and that will constitute a fitting monument to the self-sacrifice and ability

of the Canadian Army Medical Service, which has from the outset done so much to maintain the Canadian standard at the same high level which has always characterized the Royal Army Medical Corps. The opportunity is *here*, and the time for action is *now*.

THE GREAT WAR EXHIBIT AT THE ROYAL COLLEGE OF SURGEONS

PROBABLY no event in the evolution of the present War is of greater scientific value, or more productive of lasting benefit to this and later generations than the remarkable exhibition of War specimens at the Royal College of Surgeons in London, which was thrown open to the public on October 11th last by Sir Alfred Keogh, Director-General of the Army Medical Forces. The following facts are gleaned from the small handbook to the exhibit, written by Dr. Keith Conservator of the Museum, to whose executive genius the arrangement of the exhibition in its present form is largely due.

The collection on exhibition is a result of the activity of the Medical History Committee,* which was organized in November, 1914, and which from its inception has recognized as one of its first duties to collect examples of the wounds and diseases suffered by soldiers in the present war; to dissect and examine such specimens in order to fully understand their extent and nature so that the best means for their treatment might be adopted; and to preserve instructive examples so that they might be examined and studied not only by Army surgeons of to-day, but also by medical men for many generations to come. "Such specimens", in Dr.

*Apparently the first suggestion of a Medical History Committee with powers to collect specimens and data was contained in a letter from Lieut.-Colonel J. G. Adami to Sir William Osler, instancing the connexion between the Army Medical Museum of Washington and the United States Medical History of the Civil War, which was transmitted by the latter to Sir Morley Fletcher of the British Medical Research Committee.

Keith's words, "are original documents; they constitute an original and reliable source of knowledge for all time," and supply the most valuable basis possible for present and future medical and surgical treatment of the diseases and injuries of war.

In May, 1915, the Medical History Committee called the Council of the Royal College of Surgeons to its assistance and shortly thereafter memoranda were issued to all officers in charge of Military Hospitals and Casualty Clearing Stations requesting the collection of material illustrating the pathology, modes of healing and results of treatment of injuries in the present war, and giving directions for their preservation, attachment of records and despatch. In January, 1916, the collections in France were placed under the special oversight of Lieutenant-Colonel Elliott, F.R.S., with highly satisfactory results, and in the spring of 1917 Lieutenant-Colonel Sir John Bland Sutton was appointed to organize those from the military hospitals in England.

The wealth of pathological and surgical material that has poured in from the Imperial forces at all points of the Allied Front in response to these efforts was at first merely housed and indexed at the Royal College of Surgeons, with a view to working it over by experts at the close of the War; but the feeling grew and was finally expressed by Sir Arthur Sloggett, Director-General of the British forces in France, that such collections possess an immediate educative value for the medical officers serving to-day, and should therefore be open to their observation and study now. Arrangements were accordingly made for their display, and three large halls of the Museum, which had been left empty early in the War by the transfer of their historical contents (preserved in combustible alcohol) to the basement to avoid danger from air raids, were given over for their accommodation. The whole energies of the museum staff, with the assistance of a number of willing collaborators, were turned upon the preparation of this material, which is shown inter-

spersed with photographs, sketches, paintings and casts of war conditions incapable of more direct preservation, and placed in instructive juxtaposition to groups of historical material derived from the Crimean, Franco-Prussian and other wars, and to local exhibits of therapeutic and other appliances from smaller military hospitals in England.

The real nucleus and essential part of the exhibition is a series of extremely fine dissections made by Mr. S. G. Shattock, F.R.S., Pathological Curator, and Mr. Cecil Beadles. Each of these specimens represents an exact investigation made in such a way as to permit the visitor to gain at a glance results which have taken the investigators laborious pains to elucidate, and adds the value of a research into the course and treatment of wounds of the soft parts to the collection. The main characters of modern gunshot wounds can be studied also in great numbers of other specimens, those of the chest, lungs and pleura with their sequelæ being especially interesting. Other series of much interest show the lungs of men who suffered from the first poisonous gas sent over the British-Canadian troops at Ypres in 1915, in the various stages of both early and late effects; the disorganization of the various organs by *B. œrogenes capsulatus;* the kidneys in trench nephritis, etc.

A feature of extreme interest in the exhibit, which of course has been drawn from British, Australian, Canadian, New Zealand and other troops at various points of the Imperial British Front, is the pooling of certain rare experiences in surgery which throw light upon each other, and which without such a central Army collection of pathological specimens could never have been brought together. In illustration may be cited three cases, coming from different Units, in which a piece of metal was found within the heart chambers, without any injury of the heart wall, with a fourth in which the bullet was removed from the lumen of the inferior vena cava on its way to being swept on into the heart, the last specimen thus giving the clue to the path taken by the metal in the other three cases.

It is clearly understood that this is but an interim exhibit, and in spite of its large size and imposing character it is seen at a glance to be incomplete. New accessions are constantly coming in, and new dissections made, and large blanks or spaces invite further contributions. But enough is shown to demonstrate to the most uninitiated the immense value of such a carefully studied objective presentment of facts. And the whole is a monument to the enthusiasm, skill and devotion of Dr. Keith and Mr. Shattock and their colleagues in the Museum, and their collaborators in the field. When this great Imperial Exhibit that has been so well inaugurated, is carried to its ultimate completion, we may expect to see a British Army Medical Collection unsurpassed anywhere in quantity of material, and in skill of dissection, good preservation and adequate description comparing with the other great museums of England, which is the acknowledged home of objective medical museum teaching and work. The benefit to the Army Surgeon of to-morrow as well as of to-day, and the soldier who is in his care, will be beyond computation.

APPOINTMENT OF A.D.M.S. INVALIDS

THE following is the text of the official announcement made on November 30th, last, in reference to the arrangements for the care of invalid members of the Expeditionary Force:

"The Military Hospitals Commission, which has been charged with very full powers in connexion with returned soldiers, has found itself confronted with many serious problems. The number of men in its institutions has about quadrupled within the year, being at present about 11,000, with a probable increase before the new year to fifteen thousand. The heavy fighting which has recently taken place will unfortunately greatly increase this number.

"The Commission has been able fairly to keep abreast and somewhat in advance of the requirements of the invalids, in providing accommodation and equipment. Its greatest problem has been to arrange adequate medical and surgical treatment for these invalids.

"This has arisen from the following causes: The fact that so large a proportion of the medical men of the country have placed their services freely at the disposal of the military authorities; again the urgent demand for medical men at and near the front; again the fact that the treatment of those wounded or invalided in warfare has made enormous strides through experience gained since the beginning of this war. Consequently the best treatment of the invalids who return to Canada, requires that the treatment should, at least in part, be given by men who have had overseas experience.

"To meet the situation it has been arranged between the Department of Militia and Defence and the Military Hospitals Commission as follows:

"That the medical services in the institutions of the commission shall be performed by the Army Medical Corps of the Department of Militia and Defence. Lieutenant-Colonel Alfred Thompson, medical superintendent of the commission, will receive a staff appointment as Assistant-Director of Medical Services Invalids. He will, under the Director-General of Medical Services, carry on this work with a staff selected from the Army Medical Corps. The Militia Department will make arrangements by which the present medical staff can be retained. The office of Lieutenant-Colonel Thompson, A.D.M.S. Invalids, will continue to be at the headquarters of the Military Hospitals Commission. There will thus be linked together, in caring for those invalids, the Military Hospitals Commission and the Army Medical Service Corps."

We publish for the benefit of those who take an interest in the welfare of the Victorian Order of Nurses, the following resolution passed by the Executive Council of that body at their meeting in Ottawa on October 4th, 1917: "That the Executive Council of the Victorian Order of Nurses declares that it is not their intention to take any steps which would tend to the lowering of the standard of the nurses employed by the Order, but that it is the supreme desire of the members of the Executive Council to aim at a still higher standard of efficiency if possible, by every means available."

A copy of this resolution has been sent to all local associations, district committees and nurses engaged in the work of the Order.

An interesting address was given under the auspices of the Canadian Club by Dr. Howard Kelly, of Baltimore, on the occasion of his recent visit to Guelph as a guest of the medical society. Dr. Kelly considered the downfall of Germany inevitable as a result of the lack of morality and the domination of science which, intended to be a servant, had been raised to the place of authority. Discussing the reasons why the various nations had been drawn into the war, the speaker sounded a note of warning to the people of Canada and the United States who were, as he expressed it, in the "melting pot". Civilization did not mean mere material progress; the only thing that really mattered was the moral condition of the people. In the afternoon, a surgical clinic was held at the General Hospital and was attended by about seventy-five physicians, who evinced the greatest interest in the operations performed by Dr. Kelly. Later on, at a dinner given in his honour by the medical men of Guelph, Dr. Kelly gave an informal address on the use of radium in the treatment of disease.

A new journal of neurology and psychiatry—*Schweizer Archiv für Neurologie und Psychiatrie. Archives Suisses de*

neurologie et de psychiatrie. Archivio Svizzers di Neurologia e Psichiatria—has recently appeared under the direction of C. Von Monakow, professor of neurology in the University of Zürich, Switzerland. As its name indicates, it is published in three languages—German, French and Italian.

License has been granted by the Federal Trade Commission of the United States to the Abbott Laboratories of Chicago, to manufacture and sell C. C. diethylbarbituric acid, which hitherto has been manufactured by a German firm and sold under the name of Veronal. In future this drug will be known as "Barbital" and this name, together with its scientific name C. C. diethylbarbituric acid, will be printed on each package sold; the word veronal may be employed in an explanatory sense. The Abbott Company is required to pay five per cent. of its gross profits on the sale of the drug to the alien firm of E. Merck of Darmstadt, and the right to fix the price and to be the judge of the quality of the drug produced is reserved by the Federal Trade Commission.

Licenses have been granted also to the Rector Chemical Company and the Farbewerke Hoechst Company, both of New York, to manufacture and sell the drug formerly known as novocain, and in future to be called "Pro-caine", which name must appear on all packages containing this drug. The same conditions as to percentage to be paid to alien property custodian and price of drug are laid down as in the case of the Abbott Laboratories.

The Metropolitan Life Insurance Company invites physicians, public health and social workers to make use of its collection of mortality statistics, which present the principal causes of death among white and coloured wage-earners in the United States and Canada. The material covers over ten million individuals for each of the six years, 1911 to 1916. Death rates are available for each race, by sex and by age

period. The Company hopes in this way to aid in the study of disease and disability among wage-earners, and desires to stimulate medical investigation and research. By offering these statistics to the medical profession and to public health and social workers, the Company expresses also its appreciation of the coöperation which it has received from physicians and others who have replied to inquiries and have given detailed information in thousands of cases. This assistance has helped to make the statistics more accurate and valuable. All inquiries should be addressed to Statistical Bureau, Metropolitan Life Insurance Company, One Madison Avenue, New York.

The Halifax Disaster

POSSIBLY no group of men was so profoundly affected by the terrible disaster which overwhelmed the city of Halifax on the morning of December 6th, as the physicians and surgeons. Within a few minutes of the explosion the wounded were being brought to the doctors' offices; and soon vast crowds of persons, not all of whom were injured, made efficient first aid exceedingly difficult.

Some doctors were continuously at work for upwards of thirty-six hours. As might well be expected, the work at the various hospitals was suddenly increased to an enormous extent. Motor cars were bringing in the wounded by the hundreds every hour. The number of scalp and eye wounds was very large; compound fractures and depressed cranial fractures were also very numerous. Some persons had as many as eighteen to twenty distinct wounds, not all from broken glass, for many severe injuries were caused by falling wreckage. A great many serious burns had to be treated at once. Numbers of persons pinned below the debris perished by fires which broke out in the ruined houses.

The medical officers in charge of hospitals report that many wounds became septic, but that wounds about the

eyes soon cleared up, even although at first they seemed very hopeless. There was only one case of incipient tetanus, and this was prevented from developing by free injections of anti-tetanic serum. Three cases of gas gangrene were met with.

Reliable figures are not yet available to represent the number of persons killed outright, dying of injuries, permanently injured, and with partial and complete loss of sight. Such data are being collected by Major Moore, C.A.M.C., of the Medical Relief Committee.

Professor Fraser Harris has been appointed historian of the medical aspect of the disaster, and has been assigned an office in the McCurdy Building, Hollis Street. He will make use of these and other data in compiling the complete account of the calamity on its medical side.

The visiting American surgeons give high praise to the nurses of the C.A.M.C., to the V.A.D. nurses, and to those ladies possessing the certificate of the St. John's Ambulance Association.

The doctors of dental surgery worked as hard as their medical brethren, and the students of dentistry were not a whit less active than the students of medicine: both acted as stretcher bearers and gave excellent first aid.

The response of the United States to the cry of distress from Halifax was prompt and exceedingly efficient. The following units arrived in quick succession:

1. The Massachusetts State Guard from Boston, with a personnel of thirty-two, commanded by Major Harold J. Gidding; these were assigned to the building known as Bellevue, once the residence of the General commanding the Halifax Garrison.

2. Dr. E. A. Codman's private hospital staff from Boston. This comprised fourteen persons and was sent to the Y.M.C.A. building which had been rapidly transformed into a hospital.

3. The American Red Cross Unit from Providence,

Rhode Island, made up of one hundred and seven persons commanded by Major G. de N. Hough. This unit worked at first in the Halifax Infirmary and later at Bellevue.

4. The American Red Cross Unit (Boston) No. 5, consisting of one hundred and five persons in charge of Dr. W. E. Ladd and of Mr. Samuel L. N. Wolcott (A.R.C.). They went to St. Mary's College, a Roman Catholic institution hurriedly transferred into an emergency hospital.

5. The State of Maine medical unit consisting of twenty-four persons commanded by Major Gilbert M. Elliott. They went to the Halifax Ladies' College which had also been given over as a hospital.

6. The Calais Chapter of the A.R.C. from Calais with twelve of a personnel under command of Dr. William Miner and the Rev. R. A. Macdonald. This unit worked chiefly at relief dressing stations No. 1 and No. 2.

It is absolutely impossible in a short account to do justice to all the individuals and institutions to whom credit is due.

The excellent work on injured eyes done by Dr. Cox, of New Glasgow, has received high praise from his confrères in Halifax.

Captain Goodman of the United States Army left New York at 4 p.m., December 6th, and travelled on a special train which had four baggage cars full of supplies alone. His was administration work and the coördinating of the activities of the American and the Canadian Red Cross.

On all hands it is admitted that confusion in matters medical was reduced to a minimum by the clear-headed manner in which the situation was handled by Lieutenant Colonel McKelvey Bell, A.D.M.S., of the sixth military district. Within a few days of the disaster Colonel Bell had appointed a committee of administration, instituted daily reports from hospitals, ordered daily personal inspection of all hospitals and dressing stations, arranged that an officer take over the charge of statistics obtainable from hospital reports, and finally, that another officer be responsible for transportation. In this way through a central bureau, what

would otherwise have been conflicting activities were coördinated and mutually strengthened for the public good. Lieutenant Colonel Paul Weatherbee, and Captain W. H. Hattie, gave a great deal of time on this, the Medical Relief Committee.

Dalhousie University suffered very greatly in the terrible disaster. The classes which met at nine o'clock had just assembled when, without a moment's warning and in a terrific roar, every window of the medical building was blown in. Bad as the condition of class rooms was, it was nothing to that of the laboratories. In several rooms the ceilings fell in as well as the windows, and the scene of destruction almost baffled description. The laboratories of physiological chemistry, histology and biology have suffered very severely; but efforts are being made to resume teaching in all the medical classes—systematic and practical—on January 3rd, when the Christmas holidays close.

The Association

THE MEDICAL WEEK IN HAMILTON

PREPARATIONS are steadily going on for the coming combined meeting in Hamilton in the latter part of May and the early part of June next. It is, of course, impossible to announce definitely who will be the principal speakers, but if the plans of the various committees are carried out our readers may be prepared to hear the names of some of the foremost members of the profession from both sides of the water.

We regret to state that Dr. James McKenty, of Winnipeg, President-elect for the meeting which was to have been held in that city, has informed us that he will be unable to preside at the Hamilton meeting. It will therefore be necessary for the Executive Council to name some one to act in his place.

The subject of the Symposium for which the Association has become responsible, and which will be held on Friday, June 1st, is "Intracranial pressure in its medical, surgical, and pathological aspects". Prominent members of the profession both in Canada and the United States have been asked to take leading parts.

Miscellany

Book Reviews

IMPOTENCY, STERILITY, AND ARTIFICIAL IMPREGNATION. By FRANK P. DAVIS, Ph.B., M.D. Publishers: C. V. Mosby Company, St. Louis, 1917. Price $1.25.

Here we have a small volume on a subject that has received much attention at the hands of many writers. The present author has gone over the ground again, and has brought all available information up to date; and has produced a book that is entitled to careful study. He goes fully into the causes of the sexual desire, and the ways in which it may be lost. The book also contains much information on the subject of treatment. The volume will prove very interesting and useful to all who study its pages.

THE PRACTICAL MEDICINE SERIES; Comprising Ten Volumes on the Year's Progress in Medicine and Surgery. Under the editorial charge of Charles L. MIX, A.M., M.D., professor of physical diagnosis in the Northwestern University Medical School. Vol. II, GENERAL SURGERY. Edited by ALBERT J. OCHSNER, M.D., F.R.M.S., LL.D., F.A.C.S., surgeon-in-chief Augustana and St. Mary of Nazareth Hospitals. Series 1917. Chicago: The Year Book Publishers, 608 S. Dearborn Street. Price $2.00.

It is a pleasure to review this book, because it is written in a pleasing style and the information contained in it is of a trustworthy character. The author is well known to the surgical section of the medical profession, and this book will be especially appreciated by them. This volume deals with general surgery and does so in a thoroughly painstaking manner. The author is to be congratulated on having given the profession the benefit of his large experience and wide reading in so attractive a form.

CANCER: ITS CAUSE AND TREATMENT. By L. DUNCAN BULKLEY, A.M., M.D., senior physician to the New York Skin and Cancer Hospital, etc. Volume II. New York: Paul B. Hoeber, 1917. Price, $1.50.

The first volume on cancer by Dr. Bulkley was published

some time ago, and his views, as therein set forth, are now known to the medical profession. In this volume he continues his discussion of the etiology of cancer, and contends that the consumption of meats in the dietary has much to do with the causation. On the matter of treatment he urges a vegetarian diet and the use of alkalies and tonics. The book is well worth a careful study.

Diseases of Children. A Manual for Students and Practitioners. By George M. Tuttle, M.D., clinical professor of pediatrics, Washington University Medical School, etc., and Phelps G. Hurford, M.D., pediatrician, St. Louis Lutheran Hospital, etc. Third Edition; thoroughly revised and enlarged. Illustrated with 47 engravings and 3 plates. Lea & Febiger, Philadelphia and New York, 1917. Price $3.50.

This is a well known and excellent book on the diseases of children. All the diseases of childhood are concerned, and the account given of them is reliable and readable. The information is brought well up to date, and the illustrations are good. We can very confidently recommend this work to our readers.

International Clinics. A quarterly of illustrated clinical lectures and especially prepared original articles on treatment, medicine, surgery, neurology, pædiatrics, obstetrics, gynæcology, orthopædics, etc, etc. Edited by H. R. M. Landis, M.D., Philadelphia, and Chas. H. Mayo, M.D., Rochester, Minn. Vol. II. 23rd Series, 1917. Price, per year $9.00.

Internal Clinics are so well known that they require few words of commendation. This volume is up to the high standard of this long series to which it belongs. It contains articles on treatment, medicine, dermatology, gynæcology, ophthalmology, surgery, history, and a number of general topics. The series has proven its usefulness, and has come to stay.

Midwifery. By Ten Teachers. Under the direction of Comyns Berkeley, M.A., M.D., M.C., F.R.C.P., obstetric and gynæcological surgeon to the Middlesex Hospital. 710 pages with illustrations. Price 18/- net. Publishers, Edward Arnold, 41 Maddox Street, London W., 1917.

In the preface of this book on Midwifery it is stated frankly that it has been written for students preparing for their final ex-

amination, that the writers are all teachers in London medical schools, and that most of them have had experience as examiners; therefore it is hoped "that if the volume contains the collective wisdom and experience of all the schools it represents, it will prove that there is a place for this new movement in the production of students' text-books"; that in preparing the material for publication a "director" and three editors have "endeavoured to overcome to some degree the disadvantages of collective authorship"; and that the whole corps of writers has acted in an editorial and revisional capacity on every chapter of the book, both text and illustrations.

This work on obstetrics is therefore of special interest on account of the eminence of the writers and of their endeavour to produce a text-book on the subject specially for the undergraduate.

While the arrangement followed in the consideration of the various subjects is quite conventional, the whole tone of the book is incredibly insular, the English methods only being described. The metric system of measurements is ignored, delivery in the left lateral position is directed both in normal labour and in forceps cases, and the Tarnier axis-traction forceps is not even mentioned.

In the chapter on the management of labour it is remarkable that in a work specially prepared for students, no mention is made either of an aseptic or anti-septic technique, though it is directed that the patient in labour is to have a warm bath, "after which the external genitals and the surrounding skin are thoroughly cleansed". The only mention of the importance of an aseptic technique in the management of normal labour occurs in the chapter on puerperal sepsis.

It is difficult to understand why over nine pages should be devoted to pyelo-nephritis, while an important subject like eclampsia is covered in fourteen pages.

In discussing the treatment of puerperal sepsis it is recommended that "in all cases of suspected puerperal sepsis a bacteriological examination of the lochial discharge should be made"; that two swabs should be obtained, one from the interior of the uterus, and the other from the vagina, and that from these, intermediate smear preparations should be made as well as cultures. It is also stated that digital exploration of the uterine cavity is "indicated in all cases in which there is reasonable suspicion, owing to the large size and tenderness of the uterus and abnormal amount

and offensivenesss of the lochia, that placenta, membrane, or blood clot have been retained". It is recognized that this procedure is useless and often dangerous, especially when signs of consecutive lesions or general sepsis are already present. Whether such teaching is wise is open to question, and in the reviewer's opinion it is actually dangerous.

While these and other faults may be found with the book it has not a few good qualities. The subjects are on the whole well written, the style being unusually simple and clear. The illustrations are not as satisfactory as they might be, tending too much toward the diagrammatic. It is on the whole open to doubt whether this "new movement in the production of students' textbooks" has been successful, at least in this instance.

ASTHMA: PRESENTING AN EXPOSITION OF THE NONPASSIVE EXPIRATION THEORY. By O. H. BROWN, A.B., M.D, PH.D., formerly assistant professor of medicine, St. Louis University. 322 pages with thirty-six engravings. Price $4.00. Publishers: C. V. Mosby Company, St. Louis, 1917.

In this volume Dr. Brown has produced a book of special interest and value to the medical profession. To quote the author "Asthma, 'dramatic in symptoms', 'elusive in pathology', 'cloaked in mystery' has been the theme of much careful research and the subject of countless discussions."

His work is, he admits, argumentative, supporting his "non-passive expiration" theory, but in fairness, an exhaustive study of the historical data and theories of asthma, with an analysis of the same, is included.

Chapters on the special anatomical features and physiology of the organs of respiration are inserted. A clear and concise explanation of the author's "non-passive expiration" theory is followed by a discussion of the popular muscle spasm theory.

Dr. Brown presents the results of an exhaustive and careful investigation of the causes of asthma and discusses the importance of the reflexes from the nose and upper air passages.

The history, pathology, physical signs and diagnosis, with the presentation of clinical cases, precede the chapters devoted to the treatment of asthma.

The book, of undoubted scientific interest, has entailed an immense amount of painstaking research. A glance at the bibliography suggests to the reader the thoroughness with which Dr. Brown pursued his investigations.

The final chapter "Problems bearing on Asthma," is brimful of suggestions to students and investigators of this distressing ailment.

EYE, EAR, NOSE AND THROAT. A Manual for Students and Practitioners. By HOWARD CHARLES BALLENGER, M.D., professor of oto-laryngology in the Chicago Eye, Ear, Nose and Throat College, and A. G. WIPPERN, M.D., attending occulist and aurist to St. Elizabeth's Hospital, Chicago. New second edition, thoroughly revised. 503 pages, illustrated with 180 engravings. Publishers: Lea & Febiger, Philadelphia and New York, 1917.

This second edition of the work of Dr. Ballenger and Dr. Wippern on the Eye, Ear, Nose and Throat has been thoroughly revised by them and as a ready reference book would be of value in the library of student or practitioner.

THE INTERNAL SECRETIONS: THEIR PHYSIOLOGY AND APPLICATION TO PATHOLOGY. By E. GLEY, M.D., member of the Academy of Medicine of Paris. Translated from the French and edited by MAURICE FISHBERG, M.D., clinical professor of Medicine, New York University and Bellevue Hospital Medical College. 231 pages. Price $2.00. Publishers: Paul B. Hoeber, New York, 1917.

In this book of a few more than two hundred small pages, Professor Gley, after tracing the history of the development of the present conception of internal secretion, summarizes what is known as well as what is not known of both the physiological and pathological actions of the endocime glands. He shows some mistakes in methods and conclusions that have been made in the study of and therapeutic use of these glands and suggests fields of research and proper methods of investigation necessary to make their products useful in treatment of disease.

HANDBOOK OF ANATOMY. By JAMES K. YOUNG, M.D., F.A.C.S., Professor of orthopaedic surgery, Philadephia Polyclinic. Fifth edition, revised and enlarged. 422 pages with 154 engravings. Price $2.00 net. Publishers: F. A. Davis Company, 1914 Cherry Street, Philadelphia, 1917.

It is somewhat startling to find a treatise on anatomy compressed into a compact volume of 422 moderate sized pages. The

author is to be congratulated on being thus able to epitomize such an extensive subject. All the descriptions are brief and to the point so that the book ought to commend itself specially to the busy general practitioner who wishes to refresh his memory quickly on any given point. The illustrations are on the whole satisfactory for a book of this size. The bone illustrations have evidently been for the most part reproduced from Gray's "Anatomy". The descriptive lettering on these is in many cases too small to be easily read, in Fig. 47 for example. Figs. 82 and 85 would have had their value much enhanced by the addition of an outline of the bones and also of the limbs in order to give the reader a better idea of the level at which the various arterial branches come off. The diagrams of the cranial nerves and spinal nerve plexuses are in most cases too complicated, while the explanatory lettering is again too minute for convenient study. It is well to note that the author lays some stress on the importance of the lymphatic system. He treats the important lymphatic drainage areas of the mamma with scant courtesy, however. The addition of a special chapter on Dental Anatomy will, we feel sure, enhance the value of the book considerably. It forms good reading. There are a few minor errors. The nerve supplies of four of the palatal muscles are wrongly given while two nerve supplies on page 137 and one on page 159 are likewise inaccurate. Schäfer's name has been misspelt on page 6. On page 94 *pollicis* should be *hallucis*. The book is evidently still in need of reëditing, and the author would do well to note this fact in the preparation of a new edition.

Obstetrics, Normal and Operative. By George Peasie E. Shears, B.S., M.D., professor of obstetrics and attending obstetrician at the New York Polyclinic Medical School and Hospital; and E. E. Shears, M.D., Second revised edition. 734 pages with 419 illustrations. Price $6.00. Publishers: J. B. Lippincott Company, Philadelphia, London, and Montreal, 1917.

This is preëminently a book of diagrams, many excellent and full of instruction. Not that there is not also good writing in it; but the diagrams and figures are so numerous and clear that the subject could almost be learned from them alone. It is a volume full of *practical* matter. Particularly good are the chapters on the use of the forceps and on version; but it is not fair to single out any part as less thoroughly treated than any other. It is a mine of wealth obstetrically.

INTERNATIONAL CLINICS. A Quarterly of Illustrated Clinical Lectures and Especially Prepared Original Articles. Edited by H. R. M. LANDIS, M.D., Philadelphia, with the collaboration of CHAS. H. MAYO, M.D., and others. Volume III. Twenty-Seventh series, 1917. Publishers: J. B. Lippincott Company, Philadelphia, London and Montreal.

This volume has amongst other papers the following: A study of arterial blood-pressures; Cirrhosis and cancer of the liver; Tetanus in the war of 1914; Neurasthenia before and after the war; Constitutional psychopathy; Reconstructive surgery of the extremities; Shoulder joint fractures; Nerve injuries and Hermaphrodism. There are numerous plates and charts.

DISEASES OF THE SKIN. By RICHARD L. SUTTON, M.D., professor of diseases of the skin, University of Kansas School of Medicine. 987 pages with 833 illustrations. Second edition, revised and enlarged. Price $6.50. Publishers: C. V. Mosby Company, Metropolitan Building, St. Louis, 1917.

One of the most systematic treatises on skin diseases which it has been our good fortune to consult. No matter how rare the condition, it is illustrated. Indeed it combines the advantages of an atlas of skin diseases with a most illuminating text. The prescriptions and other therapeutic measures are carefully given. There is what is not found in all works on skin diseases an excellent introduction consisting of the normal histology of the skin. The micro-photographs are unusually clear.

MANUAL OF THE DISEASES OF THE EYE. For Students and General Practitioners. By CHARLES H. MAY, M.D., director and visiting surgeon, Eye Service, Bellevue Hospital, New York. Ninth edition, revised, with 377 original illustrations. Price $2.50 net. Publishers: Wm. Wood & Company, 51, Fifth Avenue, New York, 1917.

In some respects this book is deserving of the highest praise; its illustrations are perfect and the practical directions for ocular therapeutics very valuable. The purely physiological considerations receive scant treatment. The various theories of colour vision are inadequately dealt with. Dr. Eldridge-Green's theory should have had greater prominence given it. Some of the diagrams are admirable and not to be found in other books on the eye.

ELECTRO-THERAPEUTICS FOR MILITARY HOSPITALS. By WILFRID GARTON, M.R.C.S., L.R.C.P., Temporary Captain R.A.M.C. Price 2/- net. Publishers: H. K. Lewis & Company, 136 Gower Street, London, W.C., 1917.

An eminently practical hand-book of directions on how to use electricity for therapeutic purposes and when to expect and when not to expect improvement or cure. It is non-technical, straight forward and evidently based on the author's military experience. At least one diagram giving the exact position of the electrodes used, say, in a joint case, would have been helpful. Those thinking of using electricity in civil practice will find in this book an honest account of the subject.

MEDICAL AND SURGICAL REPORTS OF THE EPISCOPAL HOSPITAL. Volume IV. Philadelphia, Press of Wm. J. Dorman, 1916.

This volume contains some papers of rare interest, while all the articles are valuable. Some very uncommon conditions are described, for instance a case of fish bone lodged in the liver, a foreign body removed from the vitreous, congenital stenosis of the pulmonary artery. Evidently some admirable surgical and research work is done at the Episcopal Hospital. There is a sketch of the history of the institution.

Books Received

THE following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

DISEASES OF THE SKIN. By RICHARD L. SUTTON, M.D., professor of diseases of the skin, University of Kansas School of Medicine. 987 pages with 833 illustrations. Second edition revised and enlarged. Price $6.50. Publishers: C. V. Mosby Company, Metropolitan Building, St. Louis, 1917.

MIDWIFERY. By TEN TEACHERS. Under the direction of COMYNS BERKELEY, M.A., M.D., M.C., F.R.C.P., obstetric and gynæcological surgeon to the Middlesex Hospital. 710 pages with illustrations. Price 18s. net. Publishers: Edward Arnold, 41 Maddox Street, London, W., 1917.

THE PRESCRIPTION: THERAPEUTICALLY, PHARMACEUTICALLY, GRAMMATICALLY and HISTORICALLY CONSIDERED. By OTTO A. WALL, Ph.G., M.D., professor of materia medica pharmacognosy and botany in the St. Louis College of Pharmacy. Fourth and revised edition. 268 pages. Price $2.50. Publishers: C. V. Mosby Company, St. Louis, 1917.

POLIOMYELITIS IN ALL ITS ASPECTS. By JOHN RUHRAH, M.D., professor of pædiatrics in the University of Maryland Medical School, and EDWIN E. MAYER, M.D., first lieutenant in the medical officers' reserve corps, United States Army. 276 pages, illustrated. Price $3.25. Publishers: Lea & Febiger, Philadelphia and New York, 1917.

COLLECTED PAPERS ON ANALYTICAL PSYCHOLOGY. By C. G. YOUNG, M.D., LL.D., formerly of the University of Zürich. Authorized translation edited by DR. CONSTANCE E. LONG, Medical Officer, Education Board. Second edition. 474 pages. Price 15/-net. Publishers: Baillière, Tindall & Cox, 8 Henrietta Street, Covent Garden, London, 1917.

PRACTICAL GUIDE TO DISEASES OF THE THROAT, NOSE AND EAR. For senior students and junior practitioners. By WILLIAM LAMB, M.D., C.M., M.R.C.B., honorary surgeon, Birmingham Ear and Throat Hospital. Fourth edition. 346 pages. Price 8/6 net, Publishers: Baillière, Tindall & Cox, 8 Henrietta Street, Covent Garden, London, 1917.

INSANITY IN EVERY DAY PRACTICE. By E. G. YOUNGER, M.D., M.R.C.P., D.P.H., senior physician, Finsbury Dispensary. Fourth edition, 130 pages. Price 5/-net. Publishers: Baillière, Tindall & Cox, 8 Henrietta Street, Covent Garden, London, 1917.

THE FUNDUS OCULI OF BIRDS ESPECIALLY AS VIEWED BY THE OPHTHALMOSCOPE. A Study in Comparative Anatomy and Physiology. By CASEY ALBERT WOOD. Illustrated by 145 drawings in the text. Price $15.00. The Lakeside Press, Chicago, 1917.

THE PRACTICAL MEDICINE SERIES. Comprising ten volumes on the Year's Progress in Medicine and Surgery. Under the general editorial charge of CHARLES L. MIX, A.M., M.D., professor of physical diagnosis in the Northwestern University Medical School. Volume IV., GENERAL MEDICINE. Edited by FRANK BILLINGS, M.S., M.D., Head of the Medical Department and Dean of the Faculty of Rush Medical College, Chicago. Series 1917. Price $1.50. The Year Book Publishers, 608 South Dearborn Street, Chicago.

Abstracts of Medical Literature

WHAT THE AMERICAN SOLDIER NOW FIGHTING IN FRANCE SHOULD KNOW ABOUT TUBERCULOSIS. BY S. ADOLPHUS KNOPF, New York. *New York Medical Record.* November 3rd, 1917.

Dr. Knopf's article certainly has a high educational value and should be one of the required studies in the soldier's course in personal hygiene. He deals with direct and indirect cases, symptoms, methods of transmission, and precaution and cure of tuberculosis. In answer to his question, "What can the soldier in the field do to prevent becoming predisposed to tuberculosis?" he says, "Since one of the greatest predisposing causes to tuberculosis is alcohol, it is, of course, best for the soldier to abstain from the use of liquor and strong alcoholic drugs entirely. If our soldiers can grasp this one fact alone, it will place in their own hands the preventive measures for the foremost predisposing cause. Other points of importance are regular eating, cleanliness of body, rest when possible in order to avoid fatigue, regulation of bowels, drinking of pure water, and cleansing of teeth. Directions regarding wet clothing, and deep breathing exercises are also given. Dr. Knopf's article should be thoroughly mastered by the soldiers of all nations; it constitutes a valuable weapon of war.

Obituary

SURGEON ERNEST ZAVITZ STIRRETT, R.C.N.

Dr. Stirrett, who died on June 22nd, was born at Port Huron, in the year 1889 and while still very young went with his parents to live in Toronto. He was educated in the public and high schools there and is remembered as a boy of especially kind and gentle disposition. Choosing medicine as a profession, he entered the University of Toronto, where he graduated in 1915. Being in his final year when the war broke out, he was among the first of the students to offer their services to their country. During the winter of 1914 Dr. Stirrett was given a commission in the Army Medical Corps and while awaiting further orders was busy with hospital work in the Homewood Sanitarium at Guelph. Within a short time he was appointed ship's doctor on one of the Allan steamers and this was soon followed by government work on transports and a still further advancement when he was appointed surgeon to the Patrol Fleet of the Royal Canadian Navy, with headquarters on board the *Niobe* at Halifax. His term of service, however, was destined not to be long; for some time he had felt his health giving way under the strain of constant duty, but true to his nature and his ideals of service he would not give up until actually compelled to do so and until another officer had been found to take his place. When at last relieved, Dr. Stirrett hastened to his home in Toronto but lived only a few weeks, when, to quote from a letter written by President Falconer to his parents, "as we believe the young officer was promoted to higher service." Dr. Stirrett was buried with full naval and military honours, the arrangements being in charge of Commander Newcombe of the *Niobe*, Captain Ogden, C.A.M.C., and other members of the Alpha-Kappa Kappa Society, of which Dr. Stirrett was a member.

CAPTAIN R. A. IRELAND, C.A.M.C.

Captain Richard Alfred Ireland, C.A.M.C., who lost his life in France while attending to the wounded, was born in 1889 in Trenton, Ontario, and there received his early education. At the age of twenty-one, in the spring of 1911, he graduated in medicine from the University of Toronto and went into partnership

with a doctor in St. John's, Newfoundland. A year later he returned to Toronto to take the examinations of the Medical Council of Canada. He then joined the staff of the Homewood Sanitarium at Guelph, and upon the outbreak of war offered his services. As he was unable to go overseas at once, he accepted an appointment as house surgeon at the Toronto General Hospital and a few months later, in July, 1915, was called to the colours. Captain Ireland joined the 76th Battalion and the following spring went overseas, where he was transferred to the 5th Canadian Mounted Rifles. Shortly afterwards he accompanied his battalion to France and went through the battles of the Somme and Vimy Ridge. Captain Ireland's death, at the early age of twenty-seven, is much regretted. He was a man of high character and sterling worth, and of a frank and genial disposition.

CAPTAIN W. L. MacLEAN, C.A.M.C.

Captain Walter Leonard MacLean, C.A.M.C., who died in France last November from wounds received, was born in 1885 and was the son of the Rev. John and Mrs. MacLean formerly of Glace Bay and now living in the West. He was a graduate of Dalhousie University of the year 1908 and during his college days was famous as a football player. He practised for some years at Glace Bay, Nova Scotia, and as a member of the staff of the General Hospital there was closely associated with the late Captain MacCuish,* who has also made the supreme sacrifice. Captain Maclean gave up his work at Glace Bay to go to the front and was attached to a Canadian ammunition column; later he was appointed to the command of a hospital in France. In a letter written not long before his death, Captain Maclean stated that he had been on duty almost continuously and was obliged to take a few days' rest. A widow and daughter survive him.

Dr. Philip Joseph Mugan died at the St. Joseph's Hospital, London, Ontario, on December 7th, after an illness of two months' duration. He was in the forty-fifth year of his age and was born at Bothwell, Ontario. He graduated in 1904 from the University of Toronto and two years later commenced to practise in London. Dr. Mugan was a member of the Knights of Columbus and other organizations and was grand supervising medical examiner of the

*A notice of the death of Captain MacCuish appeared in the last number of the Journal.

Catholic Mutual Benefit Association of Canada. A widow and five children survive him.

Dr. Hugh McGougan, of Thamesford, Ontario, died November 25th, at the residence of his brother in Port Arthur. Dr. McGougan was forty-five years of age and had been in practice at Thamesford for the past fourteen years. He was a graduate of the medical college of Western University of the year 1902. His health had not been good for some time and he had been staying at Port Arthur for a few months in the hope that the change might do him good. He leaves a widow.

Dr. George Napier Thomas died in the Toronto General Hospital at the early age of thirty-eight years. He was born at Watertown, Ontario, and graduated from the University of Toronto in 1904. He practised at Collingwood, Bracebridge, and Haileybury, settling in 1910 in South Porcupine, where he was able to give great assistance at the time of the fire that swept that district in 1911. Dr. Thomas leaves a widow and one daughter.

Dr. John Sidney Baird, a well-known dermatologist of Winnipeg, was found dead on November 22nd. He was in the forty-fifth year of his age and a graduate of the year 1895 of the Manitoba Medical College, where he distinguished himself both as student and athlete.

Dr. Adelstan Lemoine DeMartigny, of Montreal, died at the Hôtel Dieu on November 14th, after a somewhat protracted illness. Dr. DeMartigny was in the fifty-second year of his age and had been prominent as a surgeon in Montreal for the past twenty years. He graduated from the University of Laval, Quebec, in 1890 and afterwards continued his medical studies in France, graduating with honours from the University of Paris.

Dr. Ian Thompson, surgeon on the British destroyer *Strongbow*, whose gallant action was the means of saving a number of lives when the destroyer was sunk in the recent naval engagement in the North Sea, is the son of the late Mr. W. R. Thompson of Harbour Grace, Newfoundland, and a brother of Dr. Finlay Thompson of Toronto.

The War

IN view of the criticism of the Army medical arrangements in Mesopotamia, the following extracts of a letter from No. 1 British General Hospital in Mesopotamia are of no little interest.

The writer, Captain G. Shanks, did excellent work as an officer of the C.A.M.C., attached as pathologist to the British Typhoid Hospital in France. He has since transferred to the Indian Medical Service, and was sent with an Indian army to Mesopotamia, where evidently his ability as a pathologist was immediately recognized. He writes:

"Amarah itself is about 110 miles up the Tigris from Basrah, and is of the usual type of Arab city with a population of about 10,000. It is on the left bank and consists of a line of substantial buildings facing the river and the west, backed by a crowded bazaar. All I can say about it from our point of view is that it typifies strikingly along with Basrah and other places here, the surprising magnitude of Britain's effort. It is most impressive to see such a show out here, and to stop and think of what is being done in France and elsewhere.

"We have electric light and fans and ice, and mineral waters, so that the actual conditions of living are far from unbearable. Just across the river from this hospital is an officers' club where one can have refreshments, games, tennis, and read current periodicals. It is among date palms and overlooking the river. It is quite a pleasant place to sit, in the cool of the evening about and after sunset.

"The weather has actually changed now and at present the maximum temperature is about 90° and the minimum 55°–60°. It is really very pleasant, as 90° here after 118° is cool; we can work all day without minding it. Even in the middle of summer of course the nights are pleasant.

"This hospital—the first to be installed here—is one of 600 beds. It has a venereal section. My routine consists of blood and stool work, Wassermann, or to be chary of using Hun names, complement fixation reactions, examinations for malarial parasites, Leishmanniæ, etc., etc. The stool work, examination for entamœbæ, flagellates and ova of various parasites is very interesting. Entamœba histolytica is quite common with dysentery here, and

very few stools do not show some of the flagellates such as trichomonas intest., tetramitus, or lamblia, others more rarely.

"I am delighted with the work and the satisfactory laboratory arrangements which have been made. I am also fortunate in having a good assistant to help with some of the routine and make media."

News

MARITIME PROVINCES

A EARNEST plea for the medical inspection of children attending the public schools of St. John, New Brunswick, was made by Dr. Roberts, a member of the provincial government, in an address before the Associated Charities. Resolutions in favour of such a measure have been passed by the St. John Association for the Prevention of Tuberculosis and the Children's Aid Society.

IN view of the prevalence of smallpox in the province of New Brunswick, it has been necessary to enforce compulsory vaccination in the counties of Victoria, Carleton, and York, as a measure against the further spread of the disease.

ON Thursday evening, December 20th, the Halifax Medical Society entertained the visiting American doctors, and those from outside points in Canada to a light supper. Captain John Cameron, professor of anatomy, Dalhousie University, was in the Chair. Amongst the speakers were Lieutenant-Colonel McKelvey Bell; Major Hough; Dr. W. E. Ladd, Boston; Dr. Balch, Boston; Dr. Harvey, Providence; Captain Goodman, United States Army; Colonel King Smith, Halifax; Major Morris, Halifax; and Major Hubbard, Quebec.

ONTARIO

A DEPUTATION recently waited on Sir William Hearst, Premier of the province, with a request that legislation be passed to make dental and medical inspection compulsory in the rural public schools of the province. The Premier promised serious consideration of the matter.

The following cases of notificable disease were reported in the province during the month of November: diphtheria, 432 cases, 16 deaths; measles, 385 cases; scarlet fever, 188 cases; whooping cough, 142 cases, 9 deaths; tuberculosis, 101 cases 62 deaths; smallpox, 37 cases; typhoid, 37 cases, 6 deaths; spinal meningitis, 14 cases, 5 deaths; infantile paralysis, 7 cases, 1 death. During the month 26,051,000 tubes of diphtheritic anti-toxin have been distributed by the Board of Health at a cost of $3,907, which accounts no doubt for the low death rate of 37 per cent. from diphtheria.

Major George L. McKeogh, C.A.M.C., of Chatham, has been appointed honorary president of the Great War Veterans' Association.

The plans are in course of preparation for the construction of a military hospital in High Park, Toronto, where twenty-five acres of land have been set apart for the purpose. The hospital will provide accommodation for one thousand beds and will be built on the plan of the Orpington Hospital in England. It will probably be composed of five or six separate buildings, each connected with the other. The Military Hospitals Commission proposes also to build hospitals at Kingston and on the Odell farm at London.

The following sums have been granted by the Toronto City Council to the hospitals mentioned: General Hospital, $50,000; Western Hospital, $20,000; Free Hospital for Consumptives, $40,000; Sick Children's Hospital, $38,313.72; Women's College Hospital, $33,000.

The corner stone of the new addition to the Salvation Army Rescue Home and Maternity Hospital at Toronto was laid on November 30th, last.

During the year ending September 30th, 1917, 610 patients received treatment in the Orillia General Hospital; 527 patients were discharged; fifty-one births and twenty-five deaths occurred. The average daily expenditure was $1.40 per patient.

Scarlet fever has been very prevalent in a certain section of Fort William since last August, from twenty-five to thirty cases

having been reported a month. The infection, however, is of a particularly mild type.

QUEBEC

A MILITARY hospital of 600 beds is in course of construction at Ste. Anne de Bellevue, on property adjacent to Macdonald College, which will make it possible to take advantage of the excellent facilities for vocational training offered by Macdonald College. Ste. Anne de Bellevue is beautifully situated on the banks of the Ottawa River and within easy distance of Montreal. The new institution will consist of a central administration block with four two-storey wings each containing 150 beds. Every facility for the treatment of special cases will be provided, such as electric apparatus, continuous baths, whirlpool baths, vapour baths, etc., and appliances will be installed for corrective exercises in the treatment of cases of functional or mental impairment. The intention is to make the Drummond Street Military Hospital at Montreal a centre for the observation of special cases and to transfer patients as they become convalescent to St. Annes.

MANITOBA

THE recent epidemic of diphtheria in Winnipeg was of an unusually mild type, which made it all the more difficult to control. About 90 per cent. of the cases occurred in children between the ages of five and fourteen years.

SASKATCHEWAN

THE Moose Jaw Military Hospital was officially opened by His Excellency the Governor General early in December. On this occasion Captain Armstrong, who is in command of the hospital, was presented by His Excellency with the *Croix de Guerre* with bar, a decoration which was awarded to Captain Armstrong for special service and conspicuous gallantry in France.

BRITISH COLUMBIA

ON behalf of the Canadian Patriotic Fund a deputation appeared before the Vancouver Hospital Board on November 22nd, with a request that an effort be made to reduce the fees charged beneficiaries of the Fund for hospital treatment. A joint committee of representatives of the Hospital Board, the Medical

Association, and the Patriotic Fund, was appointed to consider the matter.

THE recent action of the Board of Governors of the Vancouver General Hospital in placing overdue accounts in the hands of a solicitor for collection has resulted in a substantial increase in the hospital revenue. At the regular monthly meeting held in November it was stated that the receipts for the previous month had amounted to $44,814 and that the expenses had been $41,824.

A FINE of $100 or thirty days' imprisonment was recently imposed upon a Victoria physician who was convicted under the British Columbia Prohibition Act of prescribing intoxicants. Eleven prescriptions and six orders on vendor for a "bottle or a quart" of whiskey or brandy, given by the doctor in question, were produced in court.

MEDICAL COLLEGES

Manitoba University

A CONVOCATION was held in the Arts Building of the University on December 6th, when degrees in medicine were conferred upon the folowing graduates, twenty-eight in number. Dr. Gordon Bell, acting dean of the medical college, complimented the graduates upon the fact that every man who was fit for service had enlisted in the Army Medical Corps.

Doctor of Medicine: Morris Clayhurst Adamson, B.A., Sigurgeir Bardal, Samuel Boyle, Harry Herbert Bruser, Arthur Murray Clare, Bernard Joseph Ginsburg, Archie Edward Kennedy, Vernon Mayne Leech, Morley Semmens Lougheed, B.A., Albert Sidney McCann, Edward Neil McDonald, Dan McDougall, Roy Carlisle McLaughlin, Patrick Herman McNulty, Harry Percival McPhail, George Arnold Minorgan, Cleveland Wilder Moore, William Ewert Munro, Thomas Gordon Playford, Joseph Edward Pritchard, William Gordon Rutherford, B.A, Thorne William Shaw, Walter Felix Tisdale, Alexander Evan Venables, Stewart Austin Wallace, Russell Stanley Welch, Eli Wershof.

Master of Surgery: Samuel Frederic Boyle, Arthur Murray Clare, Morley Semmens Lougheed, B.A,. Frederic Gallagher McGuinness, Patrick Herman McNulty, Harry Percival McPhail, Cleveland Wilder Moore, Thomas Gordon Playford, William Gordon Rutherford, B.A., Walter Felix Tisdale, Stewart Austin Wallace.

Honours: Hutchinson Gold Medal for highest aggregate on entire course—Walter Felix Tisdale.

Charlotte W. Ross Gold Medal for highest standing in obstetrics and pædiatrics of the fourth and fifth years—Walter Felix Tisdale.

Dean's prizes in Medicine for highest standing in medicine and surgery respectively of the fourth and fifth years: Medicine: Archie Edward Kennedy and Harry Percival McPhail; Surgery—William Gordon Rutherford, B.A.

Medical Registrar's prize for best case reports in medicine—George Leith.

Surgical Registrar's prize for best case reports in surgery—Sigurgeir Bardal.

ARMY MEDICAL SERVICES

Official announcement is made of the appointment of Lieutenant-Colonel Alfred Thompson, medical superintendent of the Military Hospitals Commission, as Assistant Director of Medical Services Invalids. Lieutenant-Colonel Thompson will carry on the medical work of the hospitals established by the Commission, under the direction of General Fotheringham, the Director-General of Medical Services. The text of the announcement is given on another page of the Journal.

Colonel L. C. Harris, C.A.M.C., of Moncton, New Brunswick, was recently mentioned in despatches by General Haig. Colonel Harris is now in command of a 2000 bed hospital at Whitby, England.

Dr. Edna Mary Guest, of Elginfield, Ontario, has been appointed medical officer of the Scottish Women's Hospital, stationed in the Island of Corsica. Dr. Guest graduated from the University of Toronto in 1910. She received a commission as Lieutenant in the Royal Army Medical Corps and has been on duty in the Northamptonshire War Hospital at Dunstan, England.

Major J. S. Boyd, C.A.M.C., has been given the temporary appointment of senior medical officer at the Toronto Exhibition Camp.

The Military Cross has been awarded to Captain A. F. Laird,

R.A.M.C., of Blenheim, Ontario, who is medical officer of an English regiment. Captain Laird advanced with his men in the face of heavy machine gun, shell and rifle fire and remained for three days until the ground was consolidated. Although wounded himself in the shoulder, he continued to attend to the wounded. Captain Laird has been mentioned in despatches by General Haig.

The Military Cross has also been awarded to Captain Dimock S. Cassidy, R.A.M.C., formerly in practice at Tatamagouche in the province of New Brunswick, who in order to give relief to the wounded, went down a particularly dangerous mine. Captain Cassidy was severely gassed and is now undergoing treatment in London; he has suffered a complete loss of voice, which, however, it is hoped, is only temporary. His servant who asked permission to accompany Captain Cassidy, has been given the D.C.M. and is also undergoing treatment in London.

Lieutenant-Colonel LeBel, C.A.M.C., recently returned to Quebec on leave of absence. Lieutenant-Colonel LeBel went overseas with the First Canadian Contingent and has been in command of No. 8 Canadian General Hospital at St. Cloud, Paris, since June 1916.

Major Andrew Macphail, C.A.M.C., the editor of this Journal, was recently in Montreal for a few weeks on leave of absence. He returned to England on December 15th.

The following military appointments have been gazetted:

Assistant Directors of Medical Services: Temporary Major J. S. Jenkins, D.S.O., and to be temporary Lieutenant-Colonel whilst so employed; Lieutenant-Colonel H. M. Jacques, D.S.O., and to be temporary Colonel whilst so employed, vice Colonel (now General) F. J. Fotheringham, C.M.G. Temporary Lieutenant-Colonels C. E. Doherty and H. M. Robertson relinquish their appointments.

Deputy Assistant Directors of Medical Services: Major Andrew Macphail; Major W. J. Slack, vice Major J. J. Nicholas; Major T. A. Lomer, vice temporary Colonel, H. M. Jacques, D.S.O.

Lieutenant-Colonels to be temporary Colonels: A. E. Snell, D.S.O., F.S.L., C.M.G., H. M. Jacques, D.S.O., G. E. Armstrong.

To be temporary Lieutenant-Colonel: T. B. Futcher.

To be acting Lieutenant-Colonels: Temporary Majors G. B. Boyce and D. A. Whitton.

To be acting Majors: Temporary Captains G. W. Treleaven, T. F. O'Hagan and S. G. Ross.

Temporary Captain H. K. Mitchell to take rank and precedence in his corps and in the army as if his appointment as temporary Captain bore date August 23rd, 1917. Temporary Captains W. J. Bell, J. F. McCracken. L. B. Graham and C. W. Anderson resign their commissions.

Temporary Captain G. H. Emery, from Western Ontario Regiment, to be temporary Quartermaster with the honorary rank of Captain.

To be temporary Captain: Temporary Lieutenant A. V. Greaves.

To be temporary Quartermasters, with honorary rank of Lieutenant: Temporary honorary Lieutenants S. R. Balcom, Sergeant-Major H. T. Cameron and J. W. Clark, and Regimental Sergeant-Major C. B. Tomkins.

CASUALTIES

Killed in Action

Captain R. A. Ireland, R.A.M.C., of Guelph, Ontario.

Died of Wounds

Captain W. L. Maclean, C.A.M.C., of Glace Bay, Nova Scotia.

Wounded

Captain T. A. Carson, C.A.M.C. (wounded in the right hand).

Captain Colbeck, C.A.M.C., of Welland, Ontario. Captain Colbeck was wounded in the foot by the force of the explosion of a shell which fell near him, two of his toes being severed and the others injured.

Major W. Bapty, C.A.M.C.
Captain J. P. Peake, C.A.M.C.
Captain T. H. Carson, C.A.M.C.
Captain G. M. Forbes, C.A.M.C.
Captain D. A. Macleod, C.A.M.C.
Captain B. R. Mooney, C.A.M.C.
Captain W. H. Scott, C.A.M.C.
Captain H. W. Whybock, C.A.M.C.
Lieutenant A. S. Porter, C.A.M.C.

Canadian Literature

Original Contributions

The Public Health Journal, October, 1917:

The vital statistics in public health work	M. M. Seymour.
Medical supervision of school children	H. A. Payzant.
Some medico-sociological problems arising out of the war	W. H. Hattie.
Medical aspects of tobacco habit	D. Fraser Harris.
Observations of conservation of life	J. J. Cameron.

The Canadian Practitioner and Review, October, 1917:

Surgical treatment of laryngeal cancer	J. E. McKenty.
Blood chemistry as it refers to acidosis and blood sugar	R. W. Mann.

Dominion Medical Monthly, September, 1917:

Typhoid fever in rural communities	S. F. Millen.

Dominion Medical Monthly, October, 1917:

To aspasia on the desecting table	J. S. Sprague.
A few rambling thoughts of a medical officer of health	F. King.

The Canada Lancet, September, 1917:

Appendicitis a cause of intussusception	A. Groves.
Some experiences of a rural M.O.H. in enforcing the Public Health Act	W. Doan.
Diphtheria and diphtheria carriers	A. H. Speers.

The Canada Lancet, October, 1917:

The surgical treatment of varicose veins of the lower extremity	E. R. Secord.
False system of healing; No. 3, Chiropractic	J. Ferguson.

The Western Medical News, August, 1917:

Investigation and diagnosis of cases of chronic indigestion . . . A. T. Mathers.

The Western Medical News, September, 1917:

Investigation and diagnosis of cases of chronic indigestion (concluded) . A. T. Mathers.
The present position of vaccine therapy . W. Boyd.

Le Bulletin Médical de Québec, September, 1917:

Les conquêtes de l'hygiène . . E. Couillard.

Le Bulletin Médical de Québec, October, 1917:

Diagnostic bactériologique des fièvres typhoides et paratyphoides par hémoculture et ensemencement sur gélo gluco-plomb . . . . . A. Vallée.
L'oeuvre de Québec dans la lutte antituberculeuse . . . . . O. Leclerc.

The Canadian Journal of Medicine and Surgery, December, 1917:

Syphilis of the central nervous system . J. Philips.

Dominion Medical Monthly, November, 1917;

Public health in average towns . . . C. A. Patterson.
Measles: its complications and treatment . A. A. Metcalfe.

The Canadian Public Health Journal, November, 1917:

Social aspect of venereal disease problem G, Bates, D. T. Fraser, M. McPhedran.
The technique of the Bordett-Wassermann reaction for use in public health laboratories . . . . . H. K. Detweiler.
The military aspect of venereal disease problem in Canada . . . Col. F. S. Patch.
A plan for instruction in hygiene, preliminary medical inspection of students and free dispensary or hospital treatment in Canadian universities . J. G. Fitzgerald.

Dominion Medical Monthly, December, 1917:

Surface anatomy of the stomach . . George Elliott.

The Canada Lancet, November, 1917:

The Canadian Army Medical service
Col. J. T. Fotheringham.

Medical Societies

ACADEMY OF MEDICINE, TORONTO

Professor Irving Fisher, professor of political economy at Yale University, addressed the Academy of Medicine, Toronto, at its meeting on Tuesday evening, November 6th, upon the subject of Health Insurance.

He pointed out the ill effects following the failure of the working man to insure himself against sickness; whereas the wealthy man insures himself against accident, illness and death, against fire, burglary and other damage, the poor man rarely has protection. The great proportion of poverty in this country is due to illness in the household, the loss of wages and the expenses due to illness impoverish the man whose savings are scanty. Investigations of the Buffalo Charities Organization Society within the past two or three years have shown that of the cases of poverty they have had to deal with, 78 per cent. have been caused by illness.

Health Insurance will not only provide a remedy for this poverty but will be a great stimulus in preventing disease. As boiler inspection has all but eliminated the former large number of accidents due to explosives, so will health insurance arouse a healthy interest in the causation of disease, whether due to long hours, poor ventilation, careless habits, indiscriminate expectoration, lack of protection against dangerous trades and processes, or other factors in the morbidity of working men. Simple rules of personal hygiene will also be impressed upon men and women who will become interested in the scheme as they become contributors to the same.

During the past few years the average age at death in America has increased five years. Practical hygiene has accomplished

this. Yet, if the figures be closely studied, it will be found that this average has been increased through the lessened number of infant deaths. Children formerly dying in the first and second years of life are now being carried on to six, eight and ten years of age. We are preventing the acute infectious and nutritional disorders which formerly caused a high mortality in infancy, but these are only carried on for a few years. On the other hand the period of productive life has not increased. We have not prolonged life during the working years. In fact, the life expectancy at forty-five has not increased; while at fifty it has appreciably lessened during the past two decades, and at the age of sixty it has materially lessened. We have now to combat the degenerative diseases of middle life as we have combated the infections of early life. Our problem is well illustrated by the fact that of 10,000,000 conscripts of age twenty-one to thirty-one recently examined in the United States it is stated that some 60 per cent. have been rejected as medically unfit. A more careful survey was made of 1,000 employees of the Ford Motor Company, and of 1,000 bank and office workers in New York, by the Life Extension Institute. Of these 2,000, 99 per cent. were found to have minor or major defects ranging from carious teeth and nasal obstruction to hypertension, albuminuria and glycosuria. And these were a class definitely above the average of their age and station in life.

We have to face now the loss of life due to degenerative diseases of middle life, and must seek the remedy, which lies in prevention. With these diseases prevention must begin early for they as a rule develop but slowly. A health insurance bill will go far to lessen these diseases.

There was a good attendance and Professor Fisher's audience gave him a most appreciative hearing.

Dr. D. J. Gibb Wishart, the president of the Academy of Medicine, occupied the chair, and a hearty vote of thanks was proposed by one of the past presidents, Dr. Albert A. Macdonald, seconded by Major J. G. Fitzgerald.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

The seventh regular meeting of the Society was held Friday, June 1st, 1917, Dr. W. S. Morrow, president, in the chair.

Case Report: Purpuric Measles, by Dr. L. M. Lindsay (published in this issue).

Discussion: Dr. G. G. Campbell: As regards the case at the

Alexandria Hospital we have had quite a few which developed a hæmorrhagic rash during convalescence, which did not seem to interfere with the prognosis except that it kept them longer than usual in hospital, until the sixteenth or seventeenth day. It did not seem to bother the patient, there was no irritation. We had about fifteen or twenty cases last winter.

Dr. W. F. Hamilton: This case is of peculiar interest and reminds me of one of my observations made fifteen years ago on a child of seven in one of the benevolent institutions in the city during an epidemic of measles in that house. This case was the subject of recurring attacks of purpura, sometimes about the ankles, sometimes the wrists, at times general, at others over the abdomen and chest, all occurring during the course of three or four years. During the epidemic of measles this child was attacked. The rash on the other children was typical, without hæmorrhages, but in this child it was peculiarly hæmorrhagic from the start; no hæmorrhages from the nose, throat or mouth but the skin was decidedly mottled or rather purpuric. The case did as well as the others. I sometimes think that certain children will react that way to almost all exanthemata. In the case reported by Dr. Lindsay you will note that at twenty-two months it had had broncho-pneumonia, lobar-pneumonia, whooping cough, varicella and hæmorrhagic measles, multiple infections from which she could scarcely get rid of any one before another was on. That I think in itself might in some measure account for the change in the blood which is one of the causes of purpuric eruptions.

Dr. D. F. Gurd: In such cases could there be a relation between such conditions and residence in benevolent institutions? We have just gone through a very severe epidemic of measles but such cases have not been reported outside of institutions. It might be that such patients are drawn from a class of persons who are not as well nourished as those in private homes.

Dr. L. M. Lindsay: As regards the effect of institutional life on such cases I know of one case that occurred in the practice of one of our physicians in the city, though it was from a rather poor class of the community. As to hæmorrhagic diathesis it would be interesting to follow these cases up to see if they were predisposed to hæmorrhages during other exanthemata.

Papers: 1. The home treatment of tuberculosis, by Dr. D. H. Bernstein. (Published in this issue.)

Discussion: Dr. W. F. Hamilton: I must say in the very beginning that I have been deeply interested in Dr. Bernstein's

paper. Tuberculosis is a subject of perennial interest and one on which we should receive frequent stimulation. Growing out of this paper, or suggested by it, is the old truth that tuberculosis is a social disease and should be treated largely from that standpoint. Dr. Bernstein has plainly shown that sanitarium treatment is absolutely inadequate and at the same time points out the great necessity for treatment at home and under supervision, showing how absolutely impossible it is for such supervision as these patients require to be carried out by any doctor. We must have the help of the so-called social worker. So far no movement, except a sporadic movement here and there, of this nature is available. One or two hospitals may have a few social workers who follow up cases, though not tuberculosis especially, and here I think we ought to do something from the standpoint of this Society to stimulate public opinion in this matter. If we spend millions of dollars for remedial purposes, it seems to me we ought to do something for preventive purposes, especially in tuberculosis. This is a social disease, should be treated and standarized as such, and treated by a great body of social workers from the state or city funds. In speaking of this subject in Montreal it is like a voice crying in the wilderness. No hospital or society touches more than the fringe of the matter and I think we ought to move from the standpoint of the Society to stimulate interest in such an organization.

Dr. E. S. Harding: There is a great deal in Dr. Bernstein's paper that might be discussed, there is certainly a great deal in it that is commendable. He says, I think, that no disease is better known and more easily treated than tuberculosis; I would certainly criticise that statement, as I think it is one of the least known of the diseases prevailing amongst us and those that have been working along this line feel this. As to the question of sending people to the country, that I think is a way the ordinary physician at the present time has of getting out of looking after a case of tuberculosis. In a great many cases this is not advisable. We cannot get over the fact that patients suffering from tuberculosis sent to the mountains will improve in appetite and digestion, and this factor is strongly in favour of outside treatment and change to the country, But that of course is not all; a great deal deal rests with the patients themselves. If they feel in a better physical condition—and to treat them you must more or less cater to their wishes—well and good, but unless you can show results, they are often better treated in the city. I saw somewhere that the great

factor in the treatment of tuberculosis was the resistance of the patient, and in treating any individual case that factor must be taken into consideration, because to have tuberculosis there must be a lowered resistance, some factor in that person's life which is at fault. To treat the labouring man, or the class of patient in the poorer districts with that idea in view, simply means that you must correct something in the patient's life that will increase his resistance, something that has been depressing or pulling down his state of nutrition and health. Sometimes it is the work, sometimes poor nourishment, all must be taken into consideration, and when treated in that way it is surpising what will help that patient on the road to recovery. Following that idea further, coming to the wealthier classes who have tuberculosis, it is very difficult to improve their condition of living to such an extent that you can improve their resistance to disease; those are the cases who do much better in sanitaria. I do not think the sanitarium treatment is at all ideal for the poorer classes of cases, men especially; for women you can get much better results as most of them can take a certain amount of rest when it is necessary. On the other hand to tell a man, who has one or more to support in the family that he must rest for a month or two, for two or more hours every afternoon is useless; it is simply impossible. Dr. Hamilton's idea of supervising these patients in the home is the right one, the physician is not enough, they must have the regular attendance of a nurse or social worker to go into the homes, helping them to correct and change the conditions in their lives which will bring about this improvement in their health. This treatment at home is of great benefit to the average of these patients financially, but it must be well carried out. There is not one practitioner in ten who will undertake to supervise correctly one patient in the home, let alone a score of patients, the average number of cases of tuberculosis in a physician's practice; that must be done by the man who gives his whole time to the work.

Dr. S. Ortenberg: It is a pity that all the valuable points brought out to-night could not have been dilated upon, especially in regard to preventive treatment. There is a big element in this disease which has been overlooked a good deal in the public health departments of Montreal and most cities in Canada. Recently I have had no less than eight cases of what might be suspected tuberculosis, in other words crepitations in the lungs with fever, which cleared up after six weeks' to three months' treatment and each of these cases was an inhabitant either of one of these pecu-

liarly dark back parlours or basements, or ground floor dwellings. These back parlours are the most famous breeders of lung troubles known. These so-called modern houses in our cities with their ground floors usually have a cellar of about two feet deep where the ground is not cemented and where damp impure air constantly lies. Working people, staying indoors ten to twelve hours each day and coming home to these rooms have little chance against tuberculosis. It is a well-known fact that tuberculosis is not rarer in the country than in the city, hypertrophied tonsils in children are as common, as well as other conditions, and the reason is that during the long winter months the dwellers in the country are too much indoors in houses fixed to exclude all outside air. In this respect they are worse off than city people, who go out more. It is therefore not a question of city or country air but a properly habitable house. And it seems to me that if we were to practise the art of medicine rather than the profession, that is the art in the Hippocratic sense, the medical profession would go up in arms and point out to the proper health authorities that such things should not exist, that houses should be properly sanitary, the by-laws should be enforced and the public educated that bedrooms should not be used for living rooms.

Dr. Bernstein: I quite agree with Dr. Harding that the personal element plays an important rôle in the treatment of tuberculosis. But this is so because when a patient is told that he is suffering from tuberculosis he feels that his death warrant has been signed. It therefore takes such a patient a long time to overcome this feeling, in the meantime it is hard to go on with his treatment successfully. This feeling can only be overcome by educating the public and showing that tuberculosis is not necessarily fatal and can be cured. We have two institutions which exist in this city for that particular purpose. These institutions ought to undertake a little more publicity and educate the public so that people will understand a little more about the disease and will not become frightened unnecessarily. I also agree with Dr. Harding that a change of climate will often improve the appetite and make the patient feel better physically, but this condition only lasts for a short time until the novelty of the change wears off, then the patient begins to worry and becomes restless and fretful.

2. The second paper, on Acute Urinary Retention, was given by Dr. M. Lauterman.

The eighteenth regular meeting of the Society was held Friday, June 15th, 1917, Dr. W. S. Morrow, president, in the chair.

The meeting took the form of a smoker, the members of the Society being the guests of the President.

The nominations for office for the following season were made as follows: president, Dr. A. E. Garrow; vice-president, Dr. G.G. Campbell; acting secretary and treasurer, Dr. D. G. Campbell; trustee, Dr. F. A. L. Lockart.

THE KINGSTON AND FRONTENAC MEDICAL SOCIETY

The regular monthly meeting of the Society was held on November 12th, with the president, Dr. Mylks, in the chair.

Dr. Third presented a young man with dextrocardia. There were no untoward symptoms. The condition was discovered accidently. An *x*-ray plate taken by Dr. Boyce showed the heart to be the only misplaced organ.

The President reported a case of rudimentary uterus with absence of vagina. Miss W. P. age thirty-five. Complaint, irritable bladder. Upon examination it was discovered that the vagina was represented by a pouch about one inch in depth. The external genitals were small and underdeveloped. Rectal examination revealed a small nodule, about an inch in diameter, which occupied the position of the uterus. The appendages could not be made out. The patient had never menstruated. Cystoscopic examination of the bladder showed a markedly reddened trigone with a small ulcer which was responsible for the hæmaturia occasionly complained of.

Captain Hall, who has been medical officer to a hospital for venereal diseases for over a year, read a most interesting paper on the prophylaxis and treatment of these diseases, and a brief abstract is here given: In every country the problem of venereal diseases has become more and more acute as the war has progressed. In Canada, as yet, very little attempt has been made to combat the evil. The Ontario Board of Health has extended its facilities so as to include free Wassermann's, etc. In a few centres medical men are coöperating with the army medical officers and have formed a committee to deal with venereal disease and suggest some means of controlling it. A few ill-informed clergy and women have unfortunately given the subject considerable unnecessary notoriety without accomplishing anything worth while, in the way of prophylaxis. The medical profession through various medical societies should take the initiative. Seventy-

five per cent. of venereal diseases in this district are due to the gonococcus, twenty to the spirochæte, and five to chancroid. Syphilis and chancroid present a comparatively easy problem. Gonorrhoea is the most difficult to control, a large percentage of the cases becoming carriers of the disease. Early diagnosis and efficient treatment are essential to cure. Histories of cases treated emphasize the fact that the disease is now quite prevalent in the smaller towns and villages. Reference was made to the steps being taken in the old world to eradicate the disease. In Denmark, since 1906, venereal diseases have been notifiable and free clinics have been opened for treatment with duly qualified physicians in charge. In Great Britain, before the war, practically nothing had been done to control these diseases, but conditions arising from the war forced the Government to take action. Two acts were placed on the statute books. One, the Venereal Disease Act, forbids advertising and treatment by quacks, and authorizes the establishment of free clinics. An amendment to the Criminal Law imposes imprisonment or detention upon individuals that infect others. It is feared, however, that the difficulties of securing convictions under the latter Act will nullify its effect.

The following suggestions were offered as a means of controlling venereal diseases.

1. Coöperation of military, health and civil authorities in the various military districts.

2. Establishment of a National Council, its members to be selected from the medical societies.

3. More thorough instruction to medical students in diagnosis and treatment.

4. Revision of the Code of Medical Ethics whereby more trained physicians may be induced to carry on genito-urinary practice instead of leaving, as at present, the work in the hands of an inferior type of medical man.

5. Notification of these diseases.

6. Education of the public through proper medical channels, especially as to the seriousness of the disease and the advantage of early treatment.

7. Free Wassermann's, etc., and free distribution of salvarsan, or at least a considerable reduction in the present prohibitive cost.

Medical Societies

CANADIAN MEDICAL ASSOCIATION:—President—Dr. A. D. Blackader, Montreal. President-elect—Dr. James McKenty, Winnipeg. Acting Secretary-treasurer—Dr. J. W. Scane, 836 University Street, Montreal.

ACADEMY OF MEDICINE, TORONTO:—President—Dr. D. J. Gibb Wishart. Secretary—Dr. J. H. Elliot, 11 Spadina Road. Treasurer—Dr. J. H. McConnell.

ALBERTA MEDICAL ASSOCIATION:—President—Dr. D. G. Revell, University of Alberta, Edmonton South. Secretary-treasurer—Dr. T. H. Whitelaw, Medical Officer of Health, Edmonton.
Annual Meeting, Edmonton, 1918.

ASSOCIATION OF MEDICAL OFFICERS OF THE MILITIA:—President—Lt.-Colonel A. T. Shillington, A.M.C., Ottawa. Secretary—Captain T. H. Leggett, A.M.C., Ottawa.

ASSOCIATION OF MEDICAL OFFICERS OF NOVA SCOTIA—President—Dr. George E. DeWitt, Wolfville. Secretary—Dr. W. W. Hattie, Halifax.

BRANT COUNTY MEDICAL SOCIETY:—President—Dr. E. R. Secord, Brantford. Secretary—Dr. M. N. Faris.

BRITISH COLUMBIA MEDICAL ASSOCIATION:—President—Dr. J. Glen Campbell, Vancouver. Secretary—Dr. H. W. Riggs, Vancouver.

CALGARY MEDICAL ASSOCIATION—President—Dr. H. A. Gibson. Secretary—Dr. J. W. Richardson. Treasurer—Dr. J. V. Follett.

CANADIAN ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS:—President—Dr. J. A. Machado, Ottawa. Secretary—Dr. George D. Porter, Ottawa.

CANADIAN HOSPITAL ASSOCIATION:—President—Dr. H. A. Boyce, Belleville. Secretary—Dr. J. M. E. Brown, Toronto.

CANADIAN PUBLIC HEALTH ASSOCIATION:—President—Dr. J. W. Hattie, Halifax, Nova Scotia. Secretary—Dr. J. G. Fitzgerald, University of Toronto.
Annual Meeting, Hamilton, May, 1918.

CENTRAL SOUTHERN ALBERTA MEDICAL SOCIETY:—President—Dr. J. S. Murray, Okotoks. Secretary-treasurer—Dr. G. E. Learmonth, High River.

COLCHESTER-HANTS MEDICAL SOCIETY:—President—Dr. J. W. T. Patton, Truro. Secretary—Dr. H. V. Kent, Truro.

DUFFERIN MEDICAL SOCIETY:—President—Dr. Rooney, Orangeville. Secretary—Dr. Smith, Shelburne.

EDMONTON ACADEMY OF MEDICINE:—President—Dr. C. U. Holmes. Secretary-treasurer—Dr. E. L. Garner. Library, 12 Credit Foncier Building.

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The Canadian
Medical Association Journal

Vol. VIII. FEBRUARY, 1918 No. 2

ANTHRAX IN MAN WITH A REPORT OF TWO CASES

By Charles H. Gilmour, M.B. (Tor.), M.R.C.S. (Eng.)
Lieutenant-Colonel, C.A.M.C.
Senior Surgeon Bramshott Military Hospital

AND

Alexander R. Campbell, B.A., M.D., C.M.
Captain, C.A.M.C.
Pathologist, Bramshott Military Hospital

THE occurrence of anthrax is sufficiently rare especially in Canada to warrant us in reporting two cases that were recently admitted to this hospital. Both were Canadians living under the best conditions in a military training camp. Both had recently procured new shaving brushes. Both had cut themselves during shaving and both had malignant pustules at the site of injury. The shaving brushes in both cases were shown to be infected with anthrax.

The early diagnosis of anthrax is not always easy. In the rapid onset and clinical picture of the first few hours it may so resemble cerebro-spinal meningitis as to be diagnosed as such, as in Case 1 of this report. This cannot be wondered at when one reads the history, the sudden onset, the rapid rise in temperature, severe bilateral headache, followed by nausea and vomiting, a petechial rash coming out over the abdomen and thorax, and

Presented at the forty-eighth annual meeting of the Canadian Medical Association, Montreal, June 15th, 1917.

delirium following in a few hours, soon lapsing into coma. It was not until a lumbar puncture was made about six hours after the appearance of these first symptoms and the anthrax bacilli were found in the cerebro-spinal fluid that the diagnosis was cleared up. Death occurred within twenty-four hours of the appearance of the first symptoms. In Case 2 the more gradual onset with death occurring on the third day gives a more typical picture of the usual anthrax infection.

HISTORICAL. In man three forms of disease are found.

1. *Malignant pustule* is the commonest variety and may occur on any exposed part of the body liable to infection through scratches or bruises.

2. *Pulmonary anthrax* following inhalation of the organisms. The site of infection is usually in the larger bronchi though frequently no macroscopic lesion corresponding to a "pustule" can be found. This form is frequent in those who work with wool, hence the name "woolsorters disease".

3. *Intestinal anthrax* is the most uncommon form of the disease and is usually caused by eating infected material. A number of cases of food poisoning—found to have been caused by this organism—have followed the eating of improperly cooked meat.

In *cattle* the disease is known as "splenic fever" or "splenic apoplexy", in Brazil, as "gorotilho". In parts of Europe it has sometimes caused a death rate as high as 5 per cent. to 10 per cent. in sheep and cattle. Pasteur stated that "the disease is spread by worms carrying spores from the buried body to the surface". Although this may occasionally happen, it is altogether more probable that the disease is spread by the blood-stained excreta of the infected animals. Spores readily form in material that is exposed to the air, but in unopened bodies spores do not form and bacilli die in about fifteen days.

Cattle are very susceptible to feeding but less so to inoculation with the bacilli. After infection by feeding, the symptoms are blood-stained diarrhœa, colic, sweating, and convulsions. The animal dies in a few hours, its blood being loaded with the organisms. In Brazil vultures are the chief cause of the spread of gorotilho, as they eat the carcases of anthrax infected animals and though not infected themselves, disseminate the organisms through their excreta. In *sheep* the disease runs a very rapid course, death occurring quickly after an attack of hæmoglobinuria. *Horses* are less susceptible to feeding with the organism than cattle, but

are more so than the latter to inoculation. Epizooties of the disease among them in Russia are known as "Siberian fever". *Pigs* are almost immune as are also *carnivora*, *birds*, *cold blooded vertebrales* and *slugs*. However, they can usually be infected by inoculating very large doses of the bacilli and then keeping them for some hours standing in water of an unhealthy temperature. Of *rodents*, mice, rabbits, and guinea pigs are very susceptible. Rats are more immune, especially the white rat. Behring, Sawtchenko, Metchinkoff and Roux have shown that the serum of white rats contains a lysin capable of dissolving the bacillus *in vitro*.

Bacteriology. The bacillus of anthrax was discovered by a Polander in 1849 and a great amount of work has been done with it since then. In staining properties and cultural characteristics it much resembles the following organisms from which it differs chiefly in its pathogenicity, more feathery colonies on agar, and the fact that it is always non motile.

1. *Mycoides group*, e.g., *B. mycoides* and *B. ramosus*.
2. *Subtilis* (or hay bacillus) *group*, e.g., *B. megatherium*.
3. *Vulgatus group*, e.g., *B. mesentericus*, *B. mesentericus* fuscus, *B. mesentericus* ruber.

A motile bacillus (*B. maydis*) resembling *B. anthracis* is said to occur in the stools of pelagrins. The relationship of the organism to pelagra is not known but the serum of pelagrins is said to agglutinate it. When *B. anthracis* is grown at 37° C. in presence of air, spores are very quickly formed, but when grown above 4.25°C. no spores are formed and if the culture is incubated for eight to ten days the virulence of the organism is greatly reduced so that inoculation is harmless to guinea pigs and rabbits. Sheep and cattle when inoculated with this attenuated bacillus suffer from a mild attack of anthrax and become immune to a fully virulent culture. If the non-sporing attenuated form be recultured at 37°C spores will again form but the virulence does not return. Non sporing bacilli die in about fifteen days, but spores may remain alive and fully virulent in the soil for fifteen years or longer. The non-sporing organism is killed in half an hour by heating to 51°C. Spores in the dry state will resist a temperature of 100°C. for hours, but are quickly killed at that temperature when in the presence of moisture, e.g., by boiling.

Various bacteria, especially the *B. pyocyaneus*, shows marked antagonism to *B. anthracis*. Pyocyanase digests the *B. anthracis* and has been used to cure animals infected with it.

Symptoms. In malignant pustule the site of infection is

usually some exposed part of the body as the face, neck, hands or arms. The term "malignant pustule", though the one used by all authors to describe this form of anthrax infection, is not correct, as the vesicles formed always contain clear serum and never pus as the name would lead us to believe. In malignant pustule the infection occurs through an abrasion or cut in the skin, as a scratch of a nail or the cut of a razor. The wound may be very minute and be overlooked until after death. The infection is transmitted by means of the spores or bacilli which gain entrance to the body tissues through the skin wound and after an incubation period varying from a few hours to several days a small red irritable pimple appears. Much infiltration of the surrounding tissue occurs which becomes red and indurated and a ring of vesicles appears which first contain serum but later contain a blood-stained fluid and are crowded with anthrax bacilli. After twelve to twenty-four hours the central pimple, which has also become vesicular and now contains a serosanguinous fluid bursts, and the tissue dries forming a dark brown or black eschar or slough. The process in the surrounding tissue becomes more marked, the induration extends, the skin around the central eschar or slough is a brilliant red and covered with fresh vesicles and as they burst the eschar increases in size. The surrounding area is swollen and tender and the neighbouring lymph glands become swollen. The affected part is hot and itchy, but the patient may not complain of much pain. The swelling in the neighbouring tissue progresses rapidly and soon causes much local discomfort, as difficulty in breathing, and in swallowing if any infection occurs in the neck region. Constitutional disturbance may not at first be severe but soon a rise of temperature, increased pulse, headache, nausea, vomiting, giddiness, great restlessness, pains in the limbs or numbness of the extremities may be complained of and later delirium occurs. In some of the more virulent cases, as in Case 1, the progress is much more rapid, and a fatal termination may occur within twenty-four hours. From the point of inoculation a rapid spreading of the infection into the surrounding tissues occurs, possibly without much local manifestation in the way of a malignant pustule. If the point of entrance is on the face or neck the cervical and mediastinal glands rapidly become swollen, and there is a general œdema of the tissues of the neck, chest, and back. The temperature rises rapidly and the pulse becomes fast and feeble. Severe headache with pain in the chest and abdomen follows within a few hours. The temp-

erature from being raised may suddenly drop to subnormal. Respirations become shallow and embarrassed, delirium and coma following. There may be much œdema of the neighbouring tissues and lymph glands for as long as fifteen or eighteen hours, in some cases, before the infection spreads away from the primary pustule.

The bacilli are formed in small numbers after death throughout the blood stream, but the patient dies of toxæmia rather than septicæmia which is the cause of death in animals—the blood in them being loaded with the organisms. One attack in man confers absolute immunity.

Case Histories. Case 1. An officer of the C.A.M.C. on January 1st, while shaving, nicked himself with his razor, causing a small cut in the skin of the left cheek just in front of the ear. This was the first time a new shaving brush, procured in one of the small shops of the camp had been used. Nothing out of the ordinary was felt until the morning of January 3rd, when patient came to the operating room and reported he was feeling "seedy" and thought he would go and lie down. The left side of the face and neck were somewhat swollen and painful and he said he thought he was in for mumps. During the afternoon he felt worse and was seen by one of the medical officers. His temperature was then 102° F., pulse 120 and respirations 36. He was complaining of severe bilateral headache and stated he was chilly. He refused any nourishment and said that even water was repulsive to him. Towards evening he complained of difficulty in swallowing and breathing and had severe pain in his chest. His respiration was now 40, shallow and with an audible grunt. Pneumonia was feared and a consultation of three medical men was held and a careful examination of the chest made, but nothing of any abnormal nature was found. About 7 p.m. nausea and vomiting began and the bilateral headache became of the most agonizing character in spite of the medication which had been given for its relief. The vomiting became more acute and at intervals of every half hour clear gastric secretion streaked with blood was thrown off. He complained of pain in his back and limbs, and was very restless, and uncomfortable. His face and neck were becoming more swollen and very painful. Careful examination showed a razor cut anterior to the left ear which was practically healed and at that stage did not show any of the definite appearance of malignant pustule. Pain in the chest was increasing and patient was also complaining of severe pain in the epigastric

region. The pain complained of now was principally over the right lung, over the liver and in the back. Enemas were given and although the results were good no benefit resulted. Morphine was given hypodermically without benefit. About 10 p.m. a petechial rash was discernible on the abdomen. A diagnosis of cerebro-spinal fever was now made and arrangements for a lumbar puncture ordered. Patient was now slightly delirious and complained of great difficulty in swallowing and breathing. Vomiting still continued and great distress was apparent. Towards midnight convulsive seizures began, lasting about thirty seconds and occurring every few minutes. The temperature had fallen now to 99 4-5° F., the pulse was fast and thready. The petechial spots now extended over the thorax and on to the arms and legs. A lumbar puncture was performed and about 20 c.c. of bloody fluid was withdrawn. Shortly after midnight he became unconscious, with more or less general paralysis. Later there was slight twitching of the muscles, eyes were rolled upwards, and breathing very much embarrassed. The state of coma gradually deepened and death occurred within eighteen hours of the onset. Examination of the cerebro-spinal fluid showed it to be teeming with anthrax bacilli.

Facts of interest in this case are: 1. The acute onset, giving almost a perfect picture of the fulminating type of cerebro-spinal fever. 2. The infection was received from a shaving brush through a very slight razor nick, which afterwards practically healed and did not look at all like a malignant pustule but when this sore was excised and examined in the pathological laboratory it was found to be infected with anthrax bacilli. 3. The swelling of the face and neck was entirely confined to the side in which the cut occurred.

Case 2. Admitted to Bramshott Military Hospital on the night of February 27th, with following history. On February 22nd had procured a new shaving brush from Quartermaster Stores and used it for the first time on February 25th, and while shaving cut his left cheek slightly, causing free bleeding. Towards evening he began to feel poorly and complained of slight pain in region of the cut. He felt ill during the night, but did not call his medical officer. On the morning of February 26th, he shaved again, when he opened the old cut and it again bled freely. During the early part of the morning he felt better so did not report on the regular sick parade held each morning. Shortly before noon he noticed his face was swelling very rapidly around the cut,

down the side of his neck and in front and behind the ear so that his ear stood outfrom his head. He reported to his medical officer who examined his face and skin and said he thought a boil was developing. A moist antiseptic dressing was applied. During the afternoon he felt worse, had a chill and was suffering from a severe headache. He also noticed it was becoming difficult to swallow and that the swelling of the neck and face was increasing. He was seen in the evening by his medical officer who prescribed for him and ordered the dressings to his face changed. During the night of the 26th, he was very restless, complaining of severe pain about the cheek and experiencing great difficulty in swallowing and breathing, on account of the great increase in the swelling of these parts. He said he constantly felt as if he were going to choke. He had a severe headache and nausea, vomiting and shivering. Next morning, feeling very ill and exhausted, he reported to his medical officer who advised removal to the hospital. He was kept for observation in the sick detention hut during the day and arrived at the hospital at 11 p.m., February 27th. On examination he was complaining of headache, soreness and pain in the back, and numbness of the hands and feet, stating that they felt as if they had gone to sleep. The temperature was 102 3-5° F., pulse 140 and very weak. The radial could scarcely be felt. The left side of the face and neck were very much swollen, the swelling extending down over the sternum. Respirations were shallow and embarrassed. On the left cheek there was a large malignant pustule with the typical central eschar and the surrounding red indurated ring with a few vesicles on its inner edge. A smear was immediately made from the pustule and anthrax bacilli were found. Some blood was also taken for a blood culture. The treatment described below was at once carried out. Unfortunately the patient did not respond to the treatment. The following day his temperature dropped to 98° F. About noon he commenced to have a muscular twitching which subsided into coma and he died at 5.30 p.m.

It is to be noted that while in Case 1 everything pointed to meningeal irritation, in this case he was free from definite meningeal symptoms and remained perfectly clear mentally until an hour before death.

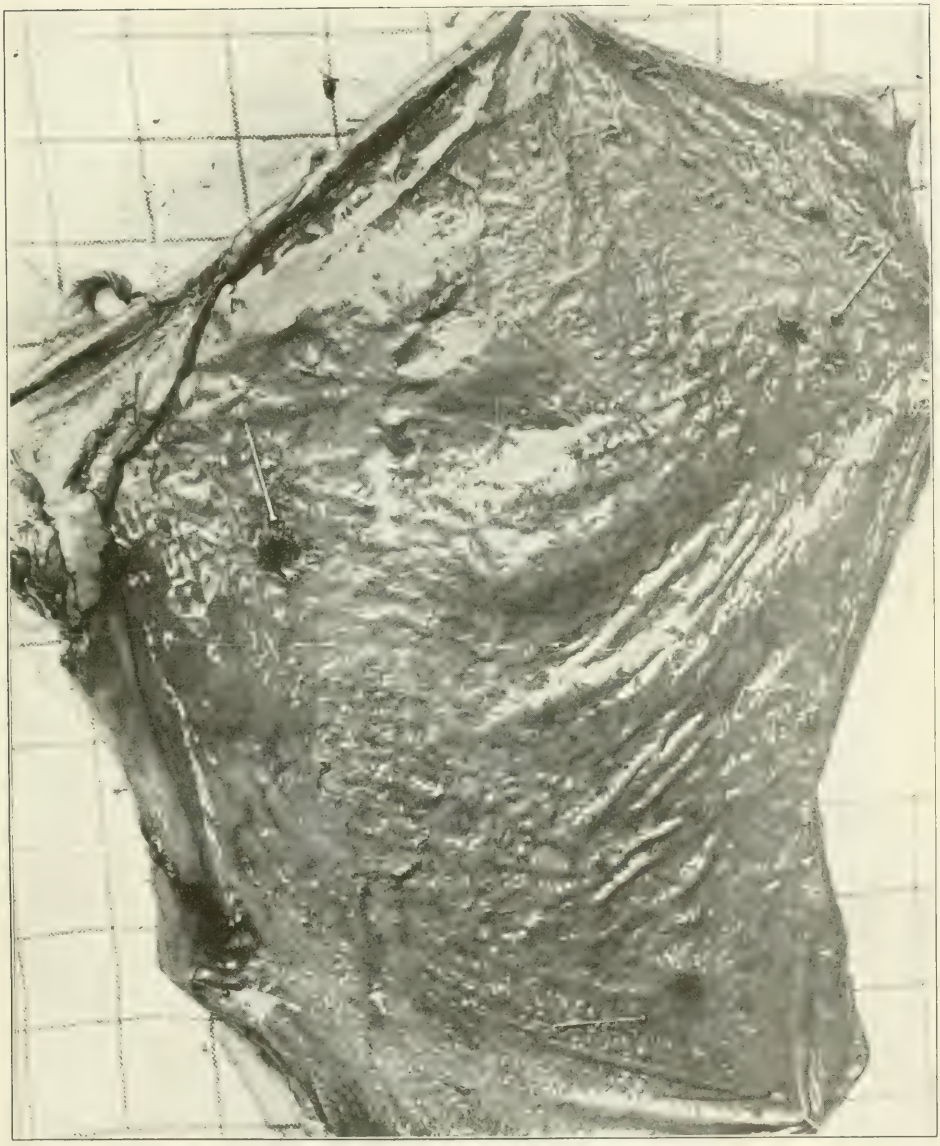
Treatment. Probably in no other infection does the prognosis depend so much on an early diagnosis with early treatment following. The bacilli remain at the site of infection from fifteen to eighteen hours, but after this period they enter the blood stream,

and the patient's chances become increasingly grave with every hour lost. As in tetanus and diphtheria, serum has proved to be the most efficient remedy at our disposal. In 1897, Sclavo prepared an anti-anthrax serum from cases which has given most encouraging results; in a series of cases reducing the death rate from 24·1 per cent. to 6·09 per cent. The serum should be administered immediately after the diagnosis is made and the first dose should be at least 40 c.c., which may be repeated if necessary. As to the mode of giving, authorities disagree. Park in his Cutter Lecture at the Harvard Medical School insisted that it should be given intravenously. He claims in diphtheria that 500 units of antitoxin given intravenously have as much effect as 20,000 units given subcutaneously. He also recommends the initial does to be 80–100 c.c. of anti-anthrax serum which may be followed at a suitable interval by 20 c.c. Recently Leishman and Smallman have published an article against the giving of serums intravenously on account of introducing the risk of anaphylactic shock, from which other methods are free.

The immediate results of giving the serum intravenously may be rather startling. There may be a severe rigor and temperature goes up to 105° F. or over, the swelling increases and the patient in appearance looks worse than ever. In a few hours improvement commences, the temperature becomes normal, the swelling subsides, and within eighteen hours it is found the bacilli have entirely disappeared from the lesions. After administering the anti-anthrax serum, preparation should be made for the free excision of the pustule. This should be done under novocaine and with every surgical care. The pustule must not be touched and all surrounding tissue handled very gently to prevent any possibility of spreading the infection. The incision should be made at least half an inch from the edge of the inflamed area, and go deep enough to get well underneath the base. After excising the pustule en masse the raw surface of the wound must be swabbed with pure carbolic or touched by the actual cautery. The wound should be left open and a sterile dressing applied.

For the pain morphine may be given, and quinine in ten grain doses every four hours has appeared helpful. Powdered ipecac in forty grain doses every four hours has also been employed with apparent benefit. With this, careful feeding, and stimulating the patient as freely as possible is carried out.

However, our main hope for successful recovery is serum administered intravenously at the earliest possible moment. If



Internal surface of stomach, Case 2. Pins point to three ulcerated areas.

the serum is given subcutaneously it should be injected into four different spots in the abdominal wall, 10 c.c. being given in each place.

Legge has summarized the effect of serum treatment by saying:

1. Even in large doses it is innocuous.

2. It can be well borne even when introduced into the veins.

3. No case taken in an early stage or a moderate severity is fatal if treated with serum.

4. With serum some cases are saved, when the condition is most critical and prognosis almost hopeless.

5. When injected into the veins the serum quickly arrests the extension of the œdematous process so as to reduce notably the danger from suffocation which exists in many of the cases where the pustule is situated on the face or neck.

6. If used soon enough it reduces to a minimum the destruction of the tissues at the site of the pustule.

7. In some situations of the pustule, as the eyelid, serum treatment must be used in preference to any other as it alone can hold out any hope of success without permanent disfigurement.

8. In internal anthrax it is the only treatment which holds out any hope of benefit.

Pathology. In cases of spontaneous infection in man and the lower animals it is stated that "The less severe the local reaction, the more severe is the subsequent septicæmia". The reverse was true in our two cases. In Case 1 with an insignificant pustule it was very difficult to find the bacilli in blood smears and in sections from the organs: but in Case 2 with a large pustule they could readily be found in the blood, and the spleen was loaded with them. However, the severity of the disease and the intensity of toxæmia in these cases were in inverse proportion to the size of the initial lesions. As elsewhere stated, Case 1 died within twenty-four hours after onset of symptoms, while Case 2 lived for three days: also the toxic degeneration of the tissues was much more marked in the former case.

Post Mortem Examinations. Case 1. Large livid spots on left shoulder, neck and ear. A few petechial spots on chest. Small dark pustule in front of left ear. Left parotid gland much enlarged, swelling extending below inferior maxilla. Rigor mortis present. Blood very dark and fluid. About eight ounces of blood-stained fluid in right pleural cavity. Numerous elevated hæmorrhagic spots over lower lobe of right lung. Left lung and pleura normal. *Pericardium* and heart normal except for cal-

cified coronaries. The *liver* was normal in size but very yellow—microscopical examination showed extreme fatty degeneration. *Stomach* contained a small amount of bloody material—mucous membrane was covered with small elevated hæmorrhagic spots and shallow ulcers with broad red margins, especially at the pyloric end and along the lesser curvature. The *small intestine* showed smaller though similar lesions in its mucosa. *Mesentery* also had a few small hæmorrhages in it. Spleen very soft and dark red in colour. Microscopical examination showed numerous areas of necrosis and fatty degeneration. *Left kidney* about the size of a small hen's egg and tightly bound to lumbar muscles (result of old perinephritic abscess). *Right kidney* about twice normal size and cloudy. *Adrenals* normal. *Pancreas* had numerous small hæmorrhages throughout its substance. *Left parotid* extremely œdematous—no hæmorrhage. *Brain*—superficial blood vessels were extremely congested, both cerebral hemispheres were covered almost completely with thick blood clots which were situated between the pia and arachnoid membranes.

Microscopical examination of a smear from contents of pustule on face showed numerous anthrax bacilli and gram positive diplococci. The latter when grown in broth assumed the form of diplo-streptococci. Growths of both organisms were also obtained from the blood. Examination of blood smears showed numerous diplococci and chains of diplo-streptococci and a few anthrax bacilli. Leucocyte count was as follows: Polymorphonuclears 58 per cent., small mononuclears 31 per cent., large 9 per cent., eosinophiles 2 per cent. Smears of the bloody cerebro-spinal fluid showed numerous chains of gram positive bacilli, and gram positive diplococci. Of the leucocytes present from 20 to 25 per cent. were eosinophiles.

Case. A blood count made an hour before death gave the following results—total whites 34,400, polymorphonuclears 77·5 per cent., large lymphocytes 2 per cent., small lymphocytes 18 per cent., transitional 2 per cent., eosinophiles 0·5 per cent. Numerous anthrax bacilli in blood smears. Pure growth of anthrax obtained on culture of blood from finger tip.

Rigor mortis extremely well marked. Considerable œdema of left side of neck and tissues over chest. Abdomen contained a considerable amount of yellow fluid. Extra peritoneal hæmorrhage in interior abdominal wall. Mediastinal tissues were extremely œdematous. *Lungs*—a few old adhesions about apices of both, several large infarcts in each—otherwise normal. *Pericardium* normal. *Heart*—no clotting of contents, the blood being very dark

and fluid. Myocardium very soft. Valves normal. Endothelium of heart and aorta stained a dark brown. *Liver* soft and normal in size, showing fatty areas about blood vessels, upper surface had numerous petechial hæmorrhages under peritoneal covering. *Spleen* normal in size. Tissue was dark brown in colour and mostly fluid, smears showed very numerous chains of anthrax bacilli and streptococci. *Pancreas* normal. *Adrenals* both hæmorrhagic, being quite rounded and full of unclotted blood. *Kidneys* congested but showing no hæmorrhage. *Bladder* about one third full of clear urine. *Omentum* extremely œdematous, being about an inch thick in places. *Stomach* normal in size, showed a number of dark brown spots on surface. On opening, contents were found to be black—(blood). Mucosa showed numerous shallow ulcers about quarter of an inch in diameter with broad red margins. (See photograph).

Small intestines. Two old healing ulcers were found about an inch below pylorus. Mucosa of entire gut showed numerous shallow ulcers with broad red margins. Contents were bloody. *Colon* normal except for a few subperitoneal petechial hæmorrhages in region of cæcum. Ascending colon full of bloody material. Ascending and descending portions surrounded by a mass of œdematous tissue, which was in places two inches thick. *Mesentery* extremely œdematous and full of hæmorrhagic spots. *Brain*—blood vessels extremely dilated. Entire cerebrum between pia and arachnoid maters covered with a layer of slightly clotted blood, which was especially thick over the upper surface. The cerebro-spinal fluid contained numerous chains of anthrax bacilli. Eosinophiles were numerous.

It will be seen from the above that the most striking pathological lesions common to both cases were: 1, the severe cerebral hæmorrhage, and 2, the peculiar type of ulcerations in the stomach and intestines. It was interesting to find the same lesions in a guinea pig which died from anthrax in thirty-six hours after inoculation with a culture obtained from a shaving brush used by the last case. The cerebral hæmorrhage in Case 2 is especially remarkable in view of the fact that he remained conscious up to a short time of his death giving few signs of a meningitic condition. Two other points are worthy of notice: 1, the association of a streptococcic infection with the anthrax in both cases. In Case 1 the septicæmia was mainly coccal and the cerebro-spinal fluid was loaded with them. In Case 2 the infection was mainly limited to the spleen. 2. The large number of eosinophiles found in the blood and cerebro-spinal fluid in these cases.

SUPRAPUBIC PROSTATECTOMY

By Norman H. Beal, M.D., F.A.C.S.

Associate Professor of Surgery, Medical Department Western University, London, Ontario

IN the short time allotted to this paper it is evident that only the salient points of so large a subject can be briefly touched upon.

Thirty-three per cent. of all normal males over fifty years of age show enlargement of the prostate, 40 per cent. of these presenting symptoms[1].

A malady so prevalent, progressive in its nature, causing ever-increasing discomfort, and finally terminating fatally unless some intercurrent disease brings happy release, demands the frequent consideration of the profession.

After a strenuous discussion extending over a period of many years we find surgeons divided into two schools: those advocating the perineal operation, and the majority in America, at least, strongly favouring the suprapubic route.

It is evident from the literature[2] that the suprapubic method gains daily in favour; and while many would hesitate to state that the "perineal operation survives only on account of certain contraindications to the suprapubic method";[3] nevertheless the majority of surgeons advocate the suprapubic method.

As a matter of fact, either type of operation is feasible, and the mortality of skilled operators is about the same for each. The technique of the suprapubic method is simpler, the functional result equally good, while post operative complications, incontinence, continuance of residual urine and persistent fistulas are reduced to a minimum.[4]

It must be granted that cases requiring surgical treatment for this condition are much too numerous to be dealt with in the clinics of a few specialists; and, while to these men we must ever look for instruction, it is evident that a safe procedure must be

Read before the surgical section of the Ontario Medical Association, Toronto, May, 1917.

Received for publication, June 5th, 1917.

evolved for the general surgeon with good hospital equipment in order that the benefits of modern surgery may be extended to the greatest number.

It is from this standpoint that the following considerations are offered, only details with which the writer has had personal experience being considered.

Some of the cases were met with in the practice of Dr. Hadley Williams, the others are personal cases.

Selection of Cases for Operation[5]

If one is to obtain a reasonable number of successful results it becomes necessary to select the cases with great care and institute appropriate treatment for each individual case. In no branch of surgery is operation "by rule" attended with such dire results. The following points must be carefully investigated:

(a) Kidney function with capacity for improvement under treatment.

(b) The cardio-vascular condition.

(c) Infection.

(d) The nature of the growth.

(a) Kidney function. While admitting the fallacy of depending on any one test we have found that the phenol sulphone-phthalein test introduced by Rowntree and Gerraghty[6] is by far the most valuable. The twenty-four hour output of urine, specific gravity, total urea and microscopic findings are of value and should certainly not be neglected. In regard to the phthalein test[7] the writer has used it since 1911, and has found in discussing the point with Canadian surgeons, that many fail to appreciate its value.

It is a common expression to hear: "I depend on the specific gravity—below 1010 being unsafe." In our limited experience we have met several instances where the specific gravity and phthalein output did *not* correspond, and specific gravity would have been a misleading guide. Young[8] and others are enthusiastic over the value of this test, and, we think, with good reason.

As an index to improvement under preliminary treatment the test is by far the most important guide we have[9]. The technique is not difficult, being easier than the estimation of the hæmoglobin. It seems possible that with care the kidney factor can be fairly accurately estimated.

(b) The cardio-vascular factor we have found more difficult to estimate, and it has been our chief factor in unsuccessful

cases. In every case the opinion of an experienced internist should be sought on this point and the preliminary treatment directed by him.

Blood pressure, particularly the range between diastolic and systolic pressure (pulse pressure) and the estimation of myocardial efficiency are the important factors. Valvular lesions are not a contraindication to operation if they are fully compensated. Decompensation is an absolute contraindication to operation whatever the underlying cause.

This class of case shows marked improvement under appropriate preliminary treatment.

(c) Infection. Cystitis is best relieved by suprapubic drainage, many weeks being required in severe cases. Bladder lavage with hypertonic saline (5 per cent.) is of service in these cases.

Epididymitis may be prevented by irrigation of the urethra with 5 per cent. argyrol[8] before each catheterization. Its onset calls for immediate suspension of the use of the retention catheter[9], which undoubtedly predisposes to this complication in cases of severe cystitis.[9]

(d) Character of the growth. Cancer of the prostate is much commoner than many suppose,[10, 11] and may occur at an early age.[12, 13]

"When retention supervenes on vesical irritation in months instead of years, after difficult and painful urination, mostly at night; when infiltration, bullet-like, board-like, leather-like or ivory-like is found in the prostate of a man who presents no symptoms of active syphilis or tuberculosis and whose blood pressure gives a negative Wassermann reaction; when the capsule of the gland has become adherent to the anterior pelvic fascia or the fascia of Denvillier and the peri-rectal fascia, but the rectal tissues are no longer movable on it, and it has lost its mobility in the pelvis, and the prostatic image to the sense of touch has become blended with one or both seminal vesicles, without the presence of acute inflammatory symptoms; when the central groove is blurred or lost, examining by the rectum over a steel instrument in the urethra; and, added to this, is loss of strength, and pain in the back, pain in the rectum, œdema of the lower extremities and neuralgia along the course of the sciatic obturator or crural nerves, it is safe to make a diagnosis of cancer of the prostate."[14]

Our experience with four cases that proved to be malignant on microscopical examination is not encouraging.

Preparatory Treatment

The importance of this is so universally recognized that it is not likely to be neglected. However, its importance cannot be over emphasized.[3, 8, 15, 16, 17] This has been an important factor in lowering the mortality of the operation.

Water. Six ounces every hour, or three quarts in twenty-four hours has improved greatly the kidney function in conjunction with a relief of back pressure. The kidney was formerly the most vital factor, half of Freyer's deaths being due to this cause.[18]

In general, surgeons are opposed to restriction of diet preliminary to any operation, and in this class of case as liberal a diet as can be assimilated should be given.

Technique

While it is true that an occasional case may justify the operation being done at one sitting, it seems to be the consensus of opinion that the two-stage operation has increased greatly the margin of safety.[19]

The first stage—cystostomy—is done under local anæsthesia, opening the bladder on the point of a sound as suggested by Murphy.[20]

If calculi are present they are removed at this stage. (In a recent case we removed seventy-four calculi from the bladder of a prostatic case aged seventy-eight, under local anæsthesia.)

Dr. Hadley Williams[21] has drawn attention to a valuable procedure in bad cases of septic bladder, viz., the three-stage operation. We believe that in several instances this was a life-saving procedure. The subsequent enucleation is performed under ether or nitrous oxide.

Much discussion has centred around what part of the gland is removed by the suprapubic method. It seems evident now that most are agreed that the procedure is really an enucleation of the enlarged lobes much in the same manner as a fibroid is occasionally shelled out from the uterine wall.[20] The posterior portion carrying the ejaculatory ducts is left behind when the enucleation is properly done. This is an important item and retains the sexual function as effectively as by the perineal route.[19]

We have found that a sound in the urethra was a distinct aid in emphasizing important landmarks.

The ease with which the lobes shell out varies in different

cases. Some shell out clean in a few seconds, others separate with difficulty and may even have to be removed piece meal.[20]

The matter of hæmorrhage is much more serious in many cases than some authors would lead one to believe. Any one who has had experience with these cases will admit that this is often a serious factor and has been fatal in many cases. The anæmia consequent on the loss of blood greatly lowers the patient's resistance to infection and favours complications.

We have used the Hagner bag[22] during the past two years and find it most efficient. If fixed to the thigh with adhesive, any degree of pressure can be exerted on the prostatic bed.

After Treatment

Of first importance is the nursing. No class of surgical case shows the character of the surgical nurse so strikingly. When possible nurses who have had experience and special training in these cases should be employed. Opinions differ as to whether male or female nurses do the best work.

Efficient bladder drainage is of primary importance. The interval syphon is very efficient and saves much work on the part of the attendants. We have introduced a syphon which can be easily set up in any ward, is silent and efficient.[24] The use of the Murphy drip or rectal tube is attended with much risk in these cases and should not be used. Cases of rectal fistula and two cases of fatal hæmorrhage from the passage of the rectal tube have been reported.[19]

Close watch should be kept for complications as early recognition is the best treatment.

Acute renal suppression is the most fatal. It must be recognized in its earliest manifestation and prompt treatment instituted, the critical period being twenty-four to seventy-two hours following operation.

Persistent nausea or beginning singultus may be the first signs.[23]

Other complications. Sloughing, epididymitis, phlebitis, and secondary hæmorrhage are due to local infection and can best be eliminated by efficient bladder drainage. Their onset should be closely watched for and appropriate treatment immediately instituted.

Conclusions

1. Suprapubic prostatectomy is the operation of choice in the majority of cases of enlarged prostate.

2. The phenol-sulphon-phthalein test should be employed to estimate renal function and its improvement under treatment.

3. The cardio vascular factor is perhaps the greatest danger, but it can be improved by treatment.

4. Many cases need prolonged preliminary treatment, often for many weeks.

5. The two and in some cases three-stage operation adds a factor of safety.

6. All precautions should be taken to lessen the amount of blood lost.

7. Employment of nurses experienced in handling this type of case is essential to success.

8. Efficient bladder drainage is the best preventive of post operative complications.

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The Alvarenga Prize for 1917 has been awarded to Dr. Wilbur C. Davidson, Baltimore, for his essay entitled: "The superiority of inoculations with mixed triple vaccine (B. typhosus, B. paratyphosus A, and B. paratyphosus B) over successive inoculations with the single vaccines, as shown by agglutinin curves in men and rabbits."

THE SURGICAL TREATMENT OF PERNICIOUS ANÆMIA

By Charles K. P. Henry, M.D., C.M.

Surgeon to the Out-Patient Department, Montreal General Hospital; Demonstrator of Clinical Surgery, McGill University

PERNICIOUS anæmia and its treatment are usually considered in common with allied diseases, as splenic anæmia, hæmolytic jaundice, secondary syphilitic anæmia, etc., and the surgical treatment is much the same, splenectomy. In pernicious anæmia the surgical treatment is still under discussion, and this paper will attempt to present the present status of this question.

By pernicious anæmia is meant that serious disease, usually of late adult life, characterized by progressive anæmia of aplastic type, high colour index, low red cell and hæmoglobin counts, no leucocytosis, retention fairly well of body weight, a yellow tinge to the skin, associated with relapses and remissions, often with spinal cord changes, and progressing to a fatal termination in six months to five years, usually in one to three years. It claims as its victims persons in the prime of life, in active public service, occurs amongst the wealthy and powerful in the land, and is as fatal as cancer, and so far has been less amenable to cure.

The present day treatment by transfusion of whole blood and splenectomy has been evolved as a result of extensive studies on the etiology and pathology of the disease. Theories of its causation have been numerous, but at present three factors are seriously considered.

All cases show, during their course, fever of moderate degree, evidences of hæmolysis, evidences of deficient blood formation—deficient for the individual in that hæmolysis exceeds blood regeneration—and often evidences of sub-infections, as pyrorrhœa alveolaris, cholecystitis, recurrent appendicitis, etc. Consequently we have the toxin theory. Toxins are probably present in all cases to some extent, and the toxins destroy the formed blood.

Read before the surgical section of the Canadian Medical Association, Montreal, June 15th, 1917.

The second theory is that pernicious anæmia may be due to deficient blood-forming organs, or, thirdly, due to persistent increased hæmolysis. King[1] and others have studied this question and the conclusions arrived at may be summarized.

In all anæmias due to toxins, nematodes, chemicals, benzol, there is an increase in the unsaturated fatty acids in the blood, and the total fats and cholesterins are decreased. These latter resist hæmolytic agents. The same condition is present in pernicious anæmia.

Operators at the time of doing a splenectomy find, in most cases, evidences of appendicitis, cholecystitis and cholelithiasis, and, in a large number of cases examined bacteriologically, there were obtained cultures from the appendix, gall bladder and spleen of the streptococcus viridans and colon bacillus, the former a powerful hæmolytic organism. Smithies reported last June that 90 per cent. of cases showed subinfections in appendix and gall bladder and all showed chronic infective changes in the spleen. The spleen is often found enlarged. The blood forming organs, the bone marrow, are hyperfunctionating early in the disease, as evidenced by bone tenderness, many embryonic red cells in the circulation, and proven by autopsies in early cases. Later these organs are exhausted and late findings show decreased blood forming power in the marrow of the long bones. The increased hæmolysis is shown by the evidences of blood destruction, found on examination of the stools and urine, with marked increase of urobilin. In pernicious anæmia the worn out red cells, or those sensitized elsewhere by toxins, are broken down by the spleen, hæmatin is given up to the spleen—liver circulation, forming bilirubin and biliverdin in excess. The bile secretion meeting the bacteria flora of the intestines evolves urobilin readily detected in excess in all cases of pernicious anæmia especially during a relapse.

Treatment then must do three things: (1) remove the source of infection, (2) make up for the lost blood by (a) transfusion of whole blood, (b) stimulation of the blood forming organs, and (3) stop hæmolysis.

The knowledge of spleen physiology and pathology is not yet complete but some facts are accepted.

No internal secretion has been established for the spleen. Its presence in the body is not necessary to the well being of the individual. Even after removal patients go through acute infections equally well with those not splenectomized.

It is the great hæmolytic organ. After its removal there is lessened urobilin excreted. There is lessening of the unsaturated fatty acids in the blood and an increase of fats and cholesterins.

After splenectomy done in cases for injury of the organ some cases of polycythæmia have resulted. After the removal digestion is improved, appetite is increased and the stomach malaise decreases. The pancreatic secretion is increased also.

Pepper and Austin estimated that in cases of pernicious anæmia the urobilin and urobilinogen before operation was three times the normal amount. Two months after operation these were only one-seventh of the quantity before operation.

W. W. Roblee[1] shows that after splenectomy the hæmolymph glands increase in size and function and sometimes in number in dogs. The thymus shows hypertrophy and the resistance of the red blood cells is increased. Experimentally it is difficult to produce jaundice by injections of toxins in dogs whose spleens have been removed, and it is easy in normal dogs.

Clinically the results of splenectomy will be discussed later.

Therefore we believe, that experimentally, and from pathological and bacteriological studies splenectomy is a rational treatment for pernicious anæmia.

Splenectomy for pernicious anæmia was first done in March, 1913, and in the last three years many cases have been recorded and this therapy is now established.

The transfusion of blood is necessarily an adjunct of treatment, and to treat a case of pernicious anæmia one must be prepared to carry out multiple transfusions. The introduction of whole blood produces definite results. It immediately makes up for blood loss. The red cells are living cells and last for two to twenty-one days. There is an immediate improvement in appearance and well-being of the patient. The blood picture improves. The hæmoglobin increases 10 to 20 per cent., the red cell count goes up 500,000 to 1,000,000 and appetite and digestion improve. Transfusion stimulates the bone marrow, and there is found after it certain definite findings. Nucleated red cells appear in the blood. It does not make new the worn out organs but helps tide over their period of repair and gives a stimulus to new growth. It prolongs the periods of remission of the disease and often initiates a remission, in one of my cases one transfusion started a remission which carried the patient's blood almost to normal, and which lasted for over four months. It increases resisting power, lowers temperature and prepares for splenectomy.

A single transfusion will no more cure pernicious anæmia than will one injection of mercury cure syphilis. Blood transfusion should be carried out systematically, repeated in a week after the first and thereafter till the hæmoglobin is above 90 per cent. and then kept not lower than 75 per cent. No authentic cures have yet been recorded, though R. D. McClure[3] has obtained excellent results in a series of cases where transfusion has been done ten to fourteen times and splenectomy during the series. Failures in doing transfusion are due to improper selection of donors and lack of systematic treatment. In all clinics I find that the agglutination test is the one depended upon, and the grouping of donors into the four blood groups of Moss facilitates the work. Chills and fever will occur in about 10 per cent. of cases, but hæmolysis and blood loss not in cases of properly selected donors. Tables giving results of blood improvement after transfusion are so common in the literature, that I simply state that in no case that I have done has there been a failure to show an immediate rise in the red cell count and hæmoglobin percentage save in two cases where hæmolysis occurred. All cases will relapse after but one transfusion.

Eppinger noted after splenectomy that there was a diminished output of urobilin. Decostello noted in analogous blood diseases, Banti's disease, etc., that splenectomy was promptly effective and recommended it in pernicious anæmia. Klemperer noted polycythæmia after splenectomy for injury. The operation was advocated by Rauzi in the United States during April and May, 1914, and has been widely practised since. Splenectomy is indicated in patients under fifty years, when less than one year ill, with a relatively good blood picture and especially where the spleen is enlarged and hæmolysis is acute. Accurate observations following splenectomy show there is an immediate polymorphonuclear leucocytosis which passes off in a few days. Later still the blood platelets are increased and still later there is an increase in the reticulated cells. "Splenectomy seems to result in the greatest stimulation of the bone marrow of any known therapeutic measure.[4]"

Many cases are not favourable operative risks, and where the hæmoglobin is 25 per cent. or lower preliminary blood transfusions should be done. The method used is immaterial; for multiple transfusions, the citrate method is the simpler, though I have used the Kimpton Brown and Vincent tubes with great satisfaction. In selected cases the mortality of the splenectomy should not be high, not over 7 per cent. The Mayo clinic reports 4 per cent.

mortality in one series of splenectomies. There was noted marked and striking improvement after operation in almost all cases. In all cases reported even with a great improvement in the blood picture after months, or even a year's duration, *the blood does not return to normal type,* and a diagnosis of pernicious anæmia can still be made even though the case is apparently well.

It is noted that the cases with enlarged spleens do best. On the contrary splenectomy should not be done during an acute crisis, or in a period where the patient shows a steady decrease in hæmoglobin and red cells, or mental torpor or cord changes. The latter, of course, shows the terminal period of the disease. W. S. Thayer, of Baltimore, reports one case with spastic paraplegia where splenectomy arrested these neurological symptoms. The patient was well for one and a half years, started a relapse and died in a short time. W. J. Mayo also states splenectomy should be done early before spinal cord changes occur.

Experimentally in animals and clinically in man, the ligation of the splenic arterial supply has been carried out with the same purpose as polar ligation in exophthalmic goitre. This measure would be expected to decrease the function of the spleen. The mortality has been high, 66 per cent. in six cases, and has not been productive of results equal to splenectomy.[5] It is possible that certain cases where the spleen at operation showed extensive perisplenitis and adhesions would offer a favourable chance for ligation rather than extirpation of the organ.

The technique of the operation does not come within the scope of this paper. It may be said that it can be done with ease in most cases by any abdominal surgeon within the period of time actually taken for a gastro-enterostomy and, with equal care in preparation, with no more shock. It is best to perform operation four to ten days after transfusion when platelets and reticulated cells are increased. It is wise to perform on the table, at the close of the operation, a moderate transfusion, 500 c.c. of whole blood. Balfour of the Mayo Clinic presents the best report on technique for 1916.[6]

The late results of any new treatment or operation are after all the only basis on which definite statements may be made. Most of the splenectomies have been done in 1915 and 1916, and, as we know, the disease shows such long remissions, often even under medical treatment, arsenic, cacodylate of soda, salvarsan, etc., so we are as yet rather too early to make dogmatic statements. All writers, operators and clinical workers agree that

splenectomy (1) initiates in a large percentage of cases a prompt remission, lasting six months usually, rarely one year. (2) That it is the best and most lasting stimulus available for the blood-forming organs. (3) That it does more for the patient than single or repeated blood transfusions. (4) That it prolongs life. I have been unable to find any writer who claims it cures pernicious anæmia.

Krumbhaar reports one hundred and fifty-three cases, with 64·7 per cent. improved clinically, and in blood picture; 15·7 per cent. not improved.

Lee reports in eight out of thirteen cases considerable temporary improvement in two months, persisting up to six months in most of them.

In Krumbhaar's series, six cases lived two years or more, one died of pneumonia three years after operation.

In Cabot's series of twelve hundred cases medically treated, 50 per cent. died in first year, one third during the following year, *three only lived over six years.* Percy reports a case who was an invalid for over two years prior to transfusion and splenectomy, and at the end of twenty-seven months was in excellent shape. Griffin reports from Rochester similar late results, thirty-nine cases with an operative mortality of three, and in June, 1916, twenty-seven cases were in good, or fairly good, condition; one lived three years.

Conclusions

Pernicious anæmia continues to be a fatal disease. Under ordinary medical treatment the duration of the disease is shorter than under surgical treatment by transfusion and splenectomy. Cases do best who come earliest under the above treatment.

The treatment must be systematic and carried out by one who is able to provide suitable donors, and to carry out the necessary blood tests for obtaining these donors.

Splenectomy should be done at a suitable time, properly prepared for, and followed by transfusion from time to time.

And of equal importance as transfusion and splenectomy, all foci of infection must be looked for and removed. The operator must be ready to do an appendectomy and cholecystectomy at the time of operation for the removal of the spleen.

Till further researches prove that there is a definite single cause for pernicious anæmia, we must conclude that the anæmia is due to some toxins or hæmolytic bacteria from hidden foci of

infection, assisted and furthered by a pathological and actively hæmolytic spleen.

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THROUGH the generous offer of the Cancer Commission of Harvard University a free diagnosis service was established in Massachusetts on October 1st, 1917. This service offers to the registered physicians of the State opportunity for the free diagnosis of pathological material removed at operation. Restrictions upon the employment of the exploratory incision in cancer tissue have been announced in connexion with this service.

MINOR INFECTIONS AND QUARANTINE

PRESIDENTIAL ADDRESS WAS GIVEN BY DR. LINCOLN IN 1917

By T. H. Whitelaw, B.A., M.B.

Medical Officer of Health, Edmonton

IN the regulations of the Provincial Health Act governing the minor infections, the intention is just as for the more serious infections, to limit and control the spread of these diseases in the community. The object of this paper is to throw some light on the practical working of these regulations, the effect their enforcement has on school attendance, and to indicate to what extent they fulfil the objects aimed at.

As regards measles, the diagnosis is usually in the great majority of cases easily made, and it is probable that a large proportion of cases, during an epidemic in our cities, is subjected to the modified quarantine imposed by the regulations, especially during the months the schools are open, when it is almost impossible for a family which has children of school age, to conceal cases of this disease and successfully to evade quarantine. The school teachers, medical inspector of schools and truant officer assist the health department greatly in obtaining information of cases of infectious disease which might otherwise be overlooked or concealed. And what are the practical results of quarantining measles? In so far as my experience goes, an epidemic once started will run its course, apparently only slightly, if at all, influenced by any measures of prevention which may be taken. The extreme infectiveness of this disease for several days before the diagnosis is usually made, is obviously the reason for this apparent failure of the quarantine regulations. The percentage of grown adults who have escaped measles during childhood is extremely low, and when I have been called upon to treat a case of measles in an adult, the symptoms have usually been so severe and dangerous, that I have not as a rule congratulated the patient on having escaped the disease in childhood. From January to May, 1916,

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Read at Alberta Medical Association Meeting in Calgary September 27th, 1917.

among several thousand soldiers in barracks in Edmonton, eighty-eight cases of measles were admitted to the isolation hospital. Very few of these had had the disease before and the majority had it in a very severe form, four deaths occurring among the eighty-eight cases. The medical officers in charge did everything possible to isolate suspects and remove cases to the hospital on the first appearance of symptoms, but in spite of their vigilance probably every man in these battalions susceptible to the disease, practically all those who had not had the disease in infancy, developed the infection. Because of these remarks I do not wish to be understood as advocating that a child should deliberately be exposed to infection in order to get it over, and yet parents who express and hold these opinions should not perhaps be criticized too severely, provided they see to it that their children are guarded against infection as far as possible when they are in poor health, or during that period of the year when complications are most likely to develop.

It being admitted that efforts made to control the spread of measles during an extensive epidemic are so utterly futile, the question arises as to what benefit the community derives from debarring from school attendance, children who already have had measles, because a younger child in the family is subjected to modified quarantine. All others from the same household are, under the regulations, permitted to leave and enter the house and mingle with the community without restriction. It is a notorious fact that during an epidemic of measles, school attendance is cut down to a minimum by the enforcement of this school regulation, and hundreds of children who are insusceptible to the disease, and no more likely to be carriers of infection than their elders, are for weeks debarred from obtaining their education. As a result of this possibly too drastic school regulation a direct inducement is held out to parents solicitous about their children's education, to conceal if possible a case of measles in the family under the school age, and this can be done with impunity provided the older children attending school are all insusceptible and the case or cases are not, in the parents' opinion, sufficiently severe to require a physician. In this way medical advice so necessary in the majority of cases to prevent sequelæ and complications, is frequently not obtained, to the permanent detriment of the patient and the disadvantage of the family physician. As a substitute for the present regulation, I offer as a suggestion, that all children who already have had the measles should be allowed to

attend school during an epidemic, and that only those who have not had the disease should be excluded in families where the infection exists. Inasmuch as the great majority of children of school age have had the disease, this could only affect a minority and would prove just as effective, or more so, in controlling an epidemic without the frightful cost in loss of school attendance. It may be suggested as an objection to this method, that second attacks are not uncommon, but in my opinion the failure to recognize the distinction between measles and German measles, accounts for a great many of these so-called secondary attacks, and in any case they are so rare as to be negligible in proportion to the total number of cases.

Whooping-cough, like measles, is a much more serious disease than commonly estimated by the community. In 1914, twenty-one deaths in Edmonton were due to whooping-cough, while diphtheria, scarlet fever and measles combined, only caused twelve deaths. In 1915 and 1916, only one death for each year was recorded as due to whooping-cough, the disease being much less common. During the present year it is again very prevalent and the death rate is likely to be again high. In the year 1913, the death rate per 100,000 of population in the following cities was:

Toronto	8.6
Montreal	7.6
New York	7.9
Boston	13.2
Belfast	10.4
London	17.7
Birmingham	18.8
Liverpool	30.3
Edinburgh	37.
Glasgow	72.8

In New York last year there were 420 deaths from whooping-cough of which

50 per cent. were in the first year.
33 per cent. were in the second year.
9 per cent. were in the third year.
5 per cent. were in the fourth year.
2 per cent. were in the fifth year.
1 per cent. were over five years of age.

Whooping-cough among children under one year of age causes

more deaths than any other infectious disease, the most dangerous period being between the ninth and twelth months, when the mortality is over 18 per cent. In addition to this it is probable that a great many cases of tuberculosis in after life have their origin in the undermining effects of whooping-cough. And what are we doing in the way of preventing this disease is a pertinent question. We quarantine, or penalize a minority of the community who are public-spirited or honest enough to report to the health department, or who employ a physician who can conceive it as a part of his duty to report the case and have quarantine established. I am satisfied that less than 50 per cent. of cases of this disease are reported to the health department or come under their supervision in the cities, and in the country districts practically none at all. If is quite common to find mothers taking their infants or young children on trains, street cars, to picture shows or Sunday school while in the early, acutely infective, or vomiting stage, with an absolute disregard of the danger of infecting other children with whom they may come in contact. If summoned to court for this, a plea of ignorance of the disease, unless a physician be involved, is usually sufficient to secure an acquittal. On the other hand, where families are living in apartments, or in crowded, or insanitary surroundings, it becomes a positive menace to the child affected, to carry out the provisions of the modified quarantine by our public health regulations, which quarantine orders that the child must be kept strictly confined to one room if possible, and not taken off the premises. It is a well-known axiom of the treatment of whooping-cough, that fresh air at all times and sometimes a complete change of climate are necessary to restore the child to good health again, or give any chance of recovery.

The causative organism in whooping-cough is now generally recognized to be the Bordet Gengou bacillus, though it cannot always be found. This organism is very short lived, is very hard to grow and is easily destroyed, unless under the most favourable environment. For these reasons it is now considered quite safe to treat whooping-cough cases in cubicles in the same ward with other patients without danger of the disease being transmitted. In support of this theory Dr. Chapin, of Providence, states "there is no evidence that air is a factor of importance in whooping-cough, or in fact in any disease except anthrax and tuberculosis". Dr. Morse states that indirect contagion is very unusual and of little importance.

Authorities differ as to the length of quarantine that should be imposed, some maintaining that it should be kept up until all paroxysmal attacks have ceased, or at least six weeks have elapsed, while Dr. Kerr, of Edinburgh, a weighty authority, believes that whooping-cough loses its infectivity as soon as the paroxysmal stage has fully developed, and that, therefore, isolation is unnecessary after the first two weeks. Formal disinfection of the house is believed to be unnecessary because the vitality of the germs outside of the human body is so slight.

From these facts and statistics we may arrive at the following conclusions.

1. That whooping-cough is a very serious infectious disease, and worthy of the closest attention and supervision by physicians and health departments, who should at all times endeavour to educate the public as to its relative importance as an infectious disease, and the value of medical advice and supervision, with quarantine restrictions.

2. That if we can protect a child from infection till he is five years of age or more, he may then develop whooping-cough with comparative safety because 96 per cent. of deaths from the disease are under five years of age. Quarantine of cases should be rigidly enforced and warnings issued to parents to take all possible precautions to avoid exposing their infants to danger of infection.

3. That to gain the coöperation of the public, and to do away with the most serious inducement to concealment of the disease, should be our endeavour. To this end, therefore, I suggest as an improvement to our present school regulations debarring all children from school in a home where, in many cases, only the baby, or at the worst, children under school age, have this disease—that the older children should be allowed to attend school from houses under modified quarantine for whooping-cough, unless they show symptoms of the disease, when of course they also should be quarantined. The danger of this disease being carried by an intermediary, is in my opinion, for the reasons already given, so slight as to be negligible. The great majority of cases of this disease, moreover, are in children under the school age, partly because older children are much less susceptible to the infection and because some of them have become immune by having had it in infancy. The confinement to the patient's own rooms or premises under quarantine, during the day, might also in the interests of the patient be modified somewhat, without adding materially to the risk of spreading the infection, it being provided that no such case taken

off the premises for an airing should be taken to any other house or public place, or allowed to mingle with, or come into contact with other children. In case it became necessary to travel by rail, in search of climatic conditions more likely to bring about a cure, the securing of a compartment to which the patient could be restricted during the journey, should be made compulsory.

Mumps is another of the minor infections where the same difficulty arises as regards school attendance, and the same carelessness, indifference or reluctance to report cases to the health departments, exists largely because of the exclusion from school required of all other members of the family. Probably in homes where quarantine for mumps is placed, and especially if those who already have had the disease were not debarred from attending school, we should have the disease more fully reported, and and have a much more efficient control of the large proportion of cases, which, after all, rather than carriers, are practically the sole source of further infection.

Chicken-pox, as regards danger to life, is the least important of the minor infections, yet the quarantine according to the regulations is just as strict as for scarlet fever and diphtheria. It is assumed as a justification for this anomaly, that many medical men are unable to diagnose between chicken-pox and smallpox. In dealing with quarantine of chicken-pox in Edmonton, the difficulty as regards strict quarantine of all persons in the house, as called for by the regulations, is overcome by giving the adults on the premises the following permit. "Permission is hereby granted to Mr. ———— to enter and leave the premises numbered ——— now under quarantine for chicken-pox, it being distinctly understood that he will not come into contact with the patient and will use every precaution to prevent the spread of the disease." Recently the following permit has been used in cases of whooping-cough. "Permission to attend school is hereby granted to ———— residing at No. ——— street or avenue, now under modified quarantine for whooping-cough, which disease he already has had, and to which he is immune. It is understood that he will occupy a sleeping apartment other than that used by the patient." I am aware that the provincial regulations do not appear to give any medical officer of health authority to issue such permits, but I trust that some amendments will shortly be passed by the provincial board legalizing such procedure. To carry out the law as it at present reads, to the letter, can only result in creating the strongest antagonism and contempt of the

community, and a desire, at all costs, to conceal cases and avoid quarantine, by subterfuge or occasionally with the collusion of the medical man who may be called, or at least have some knowledge of the case. It appears to me desirable that in the interests of the public, and to promote a greater efficiency in protecting the community against infectious disease, that the Provincial Board of Health should be requested to make such changes in the regulations, as are necessary, to bring them more into harmony with the latest developments in public health service and the well established scientific facts as regards the true sources of infection, which have displaced the theories of a generation ago. These changes, if made, would win the respect and coöperation of the public as well as the practising physician, and do away with the antagonism at present existing, which we cannot deny is not unreasonable as regards some of the clauses of the Act, and subjects the unlucky health official who has to administer the Act to a great deal of annoyance and worry.

SENTENCE of one year in jail was passed in December upon a man named John Herbert Cornish, convicted of selling to men liable for military service under the present Act, drugs which he alleged would cause palpitation of the heart.

HOW A MEDICAL HEALTH OFFICER CAN BECOME A COÖPERATIVE SOCIAL FORCE IN RURAL DISTRICTS

By Peter H. Bryce, M.A., M.D.

Chief Medical Officer, Department of Interior, Ottawa

I IMAGINE that it may not be without value to the younger public health officials and other workers to have a retrospect presented of the evolution of public health organization and methods of work during the thirty-five years since the first Provincial Board of Health in Canada was established in Ontario, in 1882, and which has become the model for most others in Canada. The Ontario Public Health Act of 1884 based upon the Consolidated Public Health of England of 1875, has also become the model upon which the public health acts of the several provinces have been based.

The first public health legislation which I am aware of in Canada was that of 1833, which provided in Upper Canada for the formation of Local Boards of Health by Order-in-Council during epidemics. It was the outcome of the cholera in 1832. In 1849, when under the Baldwin Lafontaine Government, the Municipal Act of the United Provinces of Upper and Lower Canada was passed, by which townships, villages and towns became the units of municipal governments; an Act was also passed providing for a Central Board of Health being appointed by Order-in-Council, to continue during the period fixed in Order, whenever public health necessities demanded. It will be remembered that 1848–1849 were also cholera years. Under this Municipal Act provision was made for health committees being appointed and health by-laws being passed by each council.

Such then was the situation in Canada until 1882 when the first permanent provincial board was formed and until 1884, when the Ontario Public Health Act was passed providing that each municipal council should annually appoint a local board of health

Read at the forty-eighth annual meeting of the Canadian Medical Association, Montreal, June 14th, 1917.

of five members, who would enforce the Public Health Act and health bylaws instead of the municipal councils. However, as these local boards in villages and many townships represented often a population of only a few hundred persons, it is apparent that while the system like that of the municipal councils and local boards of school trustees, is admirable in bringing home to every ratepayer his responsibility as a citizen for the public welfare in matters of health, yet in the event of epidemic outbreaks of disease it has often been necessarily financially onerous on the ratepayer when having to establish quarantines, erect isolation hospitals and pay physicians especially appointed to care for such patients. The same difficulty existed in dealing with the routine enforcement of health laws relating to nuisances, protecting of wells, disposing of refuse and so on, so that in 1894 the Executive Officers Association of Ontario began the discussion of the advisability of enlarging the unit area for a board of health's operations to the extent that whole time officers would devote all their energies to a county or at least to the area for parliamentary representation. This idea has in part been attempted both in Ontario and Quebec by appointing provincial all-time district medical officers; but it has not removed the financial disabilities often placed upon small municipalities, nor provided for the evolution of a larger conception of the true scope of the work which specially trained all-time county health officers would effect in public health and social development.

In a paper on this subject before the American Public Health Association in 1910, I set out the duties which such officers would perform in the following terms:

"To lend dignity to the office and maintain its work in close relationship with the county organization, a County Board of Health; to meet quarterly or more often in emergency, should such exist, to be composed of the Warden or elected head of the county council, ex officio, and either the senior or junior county judge, along with the medical officer. Such a board, composed wholly of officials, would add nothing materially to the cost, while questions of health, finance and law would have brought to them the experience of men trained to consider each. The health machinery would, of course, be: (a) The laboratory, required to have a minimum equipment supplied by the county, satisfactory to the Provincial or State Board, located centrally and convenient to the work by both rail and telephone; (b) In those counties where some institution as a county tuberculosis hospital or sanatorium

existed, it would often be found of real practical utility to have the medical officer placed in charge, have the laboratory there, and so centralize and enlarge his work; (c) As the county contains a number of townships, towns and villages, which may have already a sanitary officer, these would become, as in England, automatically the local officers of the county officer, with duties defined under the law, such as reporting daily when necessary, all notices of contagious diseases, and carrying out routine inspection, disinfection and policing; (d) The medical officer would similarly receive directly from physicians, or through the local inspectors, reports of outbreaks of contagious disease, and from all practising veterinarians notice of contagious disease in animals, affecting the public health. (e) The medical officer would similarly be medical inspector of the schools of his district, and would naturally carry out the physical inspection of the school children, as well as the inspection of school buildings and the control of contagious diseases. (f) He would also put in force a systematic supervision, not only of the factories in towns, but especially of the rural factories as of cheese, butter and fruit canning. (g) He would likewise systematize, through the township inspectors, the examination of dairies and the supervision of public milk supplies. (g) He would especially through local veterinarians, discover herds where tuberculosis existed, and would gradually organize a meat inspection service through centralizing the slaughter of meat to be sold to the public."

It will be realized, perhaps, how such a scheme is all the more urgent in view of the decreasing rural populations in the township and village municipalities of the Eastern provinces. Thus the census returns for 1911 give the following results:

	1901	1911	Increase
Rural, for all Canada	3,349,516	3,924,394	17.16%
Urban	2,021,799	3,280,444	62.25%
Quebec, rural	992,667	1,032,618	39,951

	1901	1911	Decrease
New Brunswick, rural	253,835	252,342	1,493
Nova Scotia, rural	330,191	306,210	23,981
P. E. Island, rural	88,304	78,758	9,546
Ontario, rural	1,246,960	1,194,785	52,184

The actual situation as regards the decline of rural population may be understood when it is known that of 400,000 immigrants

who went to Ontario during the census decade, 30 per cent. stated they were farmers or farm laborers, and yet there was a rural loss of 52,184 in addition to the loss of the total natural rural increase, while even in Quebec, the especial home of the French Canadian peasantry, the annual rural increase for the period was only 0·4 instead of 2·15 per cent., the annual average for the whole province.

To further expose the situation I find that in Ontario in 1914 the population was given at 2,749,840, of which the cities and towns over five thousand in population, held 42·1 of the whole, while 57·8, or 1,587,025, were in the smaller towns, villages and townships, which include about eight hundred municipalities. If each had its medical health officer this would mean one for two thousand. Actually there were in 1916, eight hundred and thirty-seven local boards of health, each with a medical health officer. I find that in the province of Quebec there were ninety-eight cities and towns and ten hundred and ninety-three villages and townships, or roughly, two hundred more than in Ontario. As the rural population in Quebec in 1911 was given as 60 per cent. of a population of 2,022,712, we find that with ten hundred and ninety-three municipalities the population of each is just eleven hundred, in each of which, under the Quebec Health Act, must be a "municipal sanitary authority". It must be remembered, however, that this average does not at all represent the actual situation, since in Ontario there are actually two hundred and sixty villages and towns, the minimum of population being five hundred, while in Quebec the population of the villages must, in many cases, be but a fraction of this. The minimum health unit, however, is that of Nova Scotia, where the Act requires that a health committee must be appointed for each municipal polling subdivision.

In order to complete our statistics, I have endeavoured to find out the distribution of churches and clergy. I find that, roughly, in Canada there are eight thousand Protestant clergy and four thousand Roman Catholic; but it is difficult to ascertain accurately their distribution. I find, however, that Quebec has nine hundred and ninety-four Roman Catholic parishes and that their distribution is largely the same as the municipal subdivisions. In Ontario, as in the other older provinces, every village and many rural communities have churches of some denomination and clergymen ministering to their spiritual needs.

As regards the medical services available I find that there are, in round numbers, seven thousand physicians in Canada, distributed, like the clergy, where they are required.

Many other figures would be necessary to make complete the total persons in some way engaged in public health, religious, charitable and social work, such as the total members of boards of health and sanitary inspectors, the number of layworkers in churches and religious orders and the many charity workers in our cities and towns; but each of us can easily form some estimate of what these are. Now, what we have especially to note is, that while we probably have in our rural areas, which constitute say at least 60 per cent. of the population, and that while probably two-thirds of this is actually agricultural and one-third in villages, yet very few of those representing in any way the educational or professional or social worker persons in these communities reside actually in the townships.

Such then is the constitution of municipal and social forces of the rural communities of Canada, varying but little in the newer provinces except in so far as the population is more sparse and more widely distributed. Indeed these very facts are making the need for newer methods in social evolution there so evident that in Manitoba, district nurses have already begun the work of inspection in schools, and following into their homes those children whose physical and mental needs call for attention. In Saskatchewan already twenty district hospitals have been constructed and it is expected that within two years as many more will have been established at convenient centres, to which physicians will send their patients for treatment under a regular nursing staff, who will also gradually undertake social work by district visiting; while, in addition to this necessary work, Alberta is developing social centres by having erected a "Home House" for the several school teachers of adjoining sections, added to which will be the district social nurse.

Reverting to the old East, it is apparent that for many years the loss of many of the young people of its rural population has become in many districts, little less than a war tragedy. It is as if an extended war conscription had robbed the countryside of 10 per cent. of its young adolescent population in ten years, since in some counties of Ontario this loss has been at least 1 per cent. per year. Closely examined, this condition is both an effect and cause of a social disintegration and destruction of an old time rural life, rich in numbers, in energy, in hope and in action. We have no time to enter upon an explanation of its causes; but I propose to enquire whether its reconstruction cannot be brought about by the coöperation of forces already present. It is abundantly

plain that what every large town and city have to-day developed in abundance of municipal, religious, educational and social organization are almost everywhere lacking in our rural municipalities as centres for unifying and socializing the people. As a basis for rural progress there must be a recognition of the fact that the economic life of this rural population must be adequate in return for the energy exerted and must develop social amenities sufficient to attract and retain a contented rural population. It is apparent that education of an adequate scientific character must be supplied to do this. When it is known that the old village or countryside school, once with its fifty or seventy-five children is to-day often reduced to ten or twenty, it is evident that a young school miss, presiding over a few children of different ages and paid a salary wholly inadequate to encourage permanence in the teaching profession, is in no way going to do more than play with the problem of inculcating those scientific truths, which necessarily form the basis of the permanent upbuilding of the child mind into an interested and progressive agriculturist. In no other single occupation is it pretended to-day that anything but failure can result from the neglect to make use of the most advanced scientific methods.

The war has exposed the real situation as applied to production, resulting from the lack of instruction in science, of the British nation at large, and when it is understood that not more than 5 per cent. of children reach the secondary schools, the full meaning of this can be appreciated. But this work of interesting the child mind in the phenomena of nature around him through scientific teaching must be begun from the earliest school years. Not only so, but extension of methods must be progressive as his mind grows, and school gardens, orchards, greenhouses, dairies and laboratories must be the means whereby the children are not only taught, but the community also brought together. In the good old days the transepts of St. Paul's Church and the churchyard in London were highways and places of meeting and trade for the people, while nothing seems to me more dreary and sad than to see the two isolated buildings along the country roads of our provinces often without grounds or any garden and, except on Sundays, without any sign of human interest attaching either to school or church.

Now what is needed is that the countryside become socialized. In our day of rapid transport we have only the semblance in many cases, of the old-time mediæval countryside open fields, where corn land and meadow and pasture around the villages were dis-

tributed yearly by lot and worked and used in common. How is this socializing to take place? In brief it must be by evolving a new sense of the dignity and national importance of agriculture and rural life. Who are to be its apostles? Unquestionably in addition to the coöperating farmers themselves it must be the clergy, the physicians and teachers. Even though often inexperienced and untaught in these duties, they are still the people's leaders. It is, however, interesting to note that in Quebec many of the clergy in their "Community Houses" are amongst the leaders both in the practice and theory of agriculture; while no doubt many cases exist where the rural clergy interest themselves directly in the practical problems of their people. But this has not been the practice in other communities, and too often the clergymen never gets close even to the public school pupils, nor meets his people except on Sunday, and then in his capacity as their spiritual adviser. The country doctor often comes much nearer to the interests of his community and may at times become actually a leader in practical rural affairs. He would become still more so if, as an all time medical health officer, he could with an equipped laboratory come into close practical relations with this farm life. For instance, the counties are establishing gradually, at least in Ontario, sanatoria for tuberculosis. Here might well be the starting point. Every county has still five to ten such cases per thousand of population, and through the practising physicians the county officer would come to deal not only with tuberculosis but also other problems. The outbreaks of acute contagions in cattle would at once be diagnosed through laboratory tests; the movements of the officer through his district would bring early to his notice fungous and insect diseases of plants, while his practical oversight of the surroundings of cheese factories and creameries would be but a step to his investigating and suggesting improvements in the methods of cheese making and butter making from the bacteriological standpoint. With the careful rural taxpayer I know of nothing which would so soon gain his approval of a progressive public health organization as the practical interest which a trained bacteriologist would take in actual rural production. When a great American industry can afford to set apart half a million annually for investigations in science, it must surely appear essential in an industry like agriculture, whose very future depends upon the application of the knowledge gained in every field of science that organized methods for this purpose be developed. Already these have begun through the appointment of agricultural demonstrators in some of our counties and in the

degree that such are multiplied we have every reason to feel assured that community work in our rural districts will increase. I have suggested that this work demands the closest coöperation of clergy, teachers and physicians, with the people of our rural communities, and I can conceive of nothing so likely to make this possible as the unifying of old school sections into a central or consolidated school, where a number of teachers with a trained science principal and enough buildings and equipment, would create a true educational and social centre for the people. To illustrate how the public sense is still little developed with regard to the health phase of this socializing process I shall give a statement regarding the local boards of health in six of the ten health districts of the province of Quebec, supplied through the kindness of Dr. Pelletier, secretary of the Superior Board of Health and of Dr. McCullough of the Provincial Board of Ontario, who informs me that each of the eight hundred and thirty-seven boards of health has its medical officer. In the Montreal Health District there are seventy-nine parishes, eighteen villages, thirty-two towns, six cities.

Of the important municipalities Montreal spends $250,000 in health work and employs twenty-seven medical men under a chief medical officer, while the salaries run from $5,000 to $1,500. Lachine spends $15,000, and employs three medical officers, with salaries from $1,400 to $450. Westmount pays $1,000 to its medical officer; Maisonneuve $2,000 and Verdun $1,000.

	No. of Municipalities	Boards of Health	Medical Officers	Sanitary Inspectors
Montreal District:				
Urban.....	38	20	25	19
Rural.....	97	59	49	42
Three Rivers:				
Urban.....	9	9	7	2
Rural.....	133	133	66	67
	No annual salary to medical health officer except in Three Rivers.			
Quebec:				
Urban.....	22	22	14	7
Rural.....	137	106	27	111
	Quebec City pays $2,000 and $1,800. Levis pays $400. Lauzon pays $300. Most medical officers paid when called upon.			

Fraserville:				
Urban	4	4	3	1
Rural	92	77	20	72
	Rimouski has chief of police as its sanitary officer, paid as policeman.			
St. Hyacinth:				
Urban	8	8	1	6
Rural	111	111	2	110
	No medical officer properly so called at all.			
Hull:				
Urban	3	2	1	2
Rural	130	88	52	79

It will be seen from these figures that of the eleven hundred municipalities in Quebec only two hundred and sixty-six have medical officers regularly appointed and that most of these are paid on call by the local board of health and do not receive regular salaries. In Ontario it is the common practice to pay a small salary to the medical officer and to pay him for extra services should the emergency demand it.

Now perhaps it may be said with such an attitude toward matters of public health that any hope must be small of obtaining hearty coöperation of the several social forces which I have mentioned. But I insist that the problem is not so much that of the instrument as of getting any local community to appreciate the need for coöperation toward social ends. Rural inertia, as inertia everywhere, is due to a lack of knowledge or appreciation of the desirability of the ends sought; hence methods specially suited to this purpose must be found. In the old days special agents as preachers and teachers engaged in missions and crusades; but to-day such may be accomplished through the marvellous discoveries of science, may be spread to a thousand places, which the missionary has not time to reach, by means of the press and the cinematograph. Pictures from foreign lands, especially all phases of socializing work in town or country, of rural scenes, and agricultural methods, are to-day being utilized in ever increasing extent to teach through the eye what has not been possible so readily through the ear. If such show a tractor with one man ploughing five furrows at once, it may also illustrate social gatherings, whereat exhibits of agricultural products are intimately associated with pictures and talks telling the simple truths of science upon which actual production is based. But this will be but the beginning since

moving pictures, with statistics telling the relations between the cost of production, the cost of transport, the cost of selling and what the consumer pays will arouse in the rural mind a sense of his relation to the world of affairs outside and help him to appreciate the part which agricultural life should play in the country as a whole.

But I have said enough to indicate what I wish to direct attention to: viz., the importance of arousing in the several educative agencies of our rural communities a consciousness of the need for their adopting an aggressive attitude toward the social life of their communities, and shall leave the matter to be further discussed by those perhaps more competent.

Colonel G. E. Bushnel, of the Surgeon-General's Department of the United States Army, recently stated that less than one per cent of the 800,000 men examined for the Army had been found to be tuberculous.

Case Reports

DEVELOPMENT OF HÆMORRHAGIC DISEASE FOLLOWING INJURY TO THE LIVER

By E. M. von Eberts

Surgeon to the Montreal General Hospital

THE following is a brief report of a case of hæmorrhagic disease following injury to the liver.

Mme. V. M., aged twenty-three years, was admitted to the Montreal General Hospital at 6.30 p.m. on August 23rd, 1917. She was said to have been injured in a tramway accident at 3.40 p.m. on the same day.

The patient was in a state of shock, and complained of pain in the lower part of the abdomen and in the right side of the chest. The temperature was 98 3-5°; the pulse, 120. There were contusions on the right side of the chest in the lower axillary zone, with signs of fracture of the fifth and sixth ribs near their angles. The abdomen was tender over the lower half. The gravid uterus extended to within a finger's breadth of the umbilicus. There was no vaginal discharge. The patient was given a quarter of a grain of morphine hypodermically, and the right side of the thorax was strapped with adhesive.

During the next three days her general condition improved rapidly. On August 27th, however, she complained of pain in the right side of the chest. On examination there was found dulness at the right base, with nasal voice sounds—signs which were attributed to a hæmorrhagic effusion. On August 29th—six days after admission—the patient became jaundiced. The area of dulness in the chest was found to have extended, and on rectal examination dark blood was found intimately mixed with fæcal matter. As the daily bowel movements had hitherto been free from blood, its presence at this time could not be accounted for. The theory was tentatively advanced that the blood had entered the bowel through the hepatic ducts, and that the bleeding had occurred within the liver as a result of injury associated with the fracture of the ribs.

On August 31st, 1,000 c.c. of liquid blood was aspirated from the right pleural cavity. From September 1st to the 11th, the patient made satisfactory progress, the jaundice largely subsiding. The pulse fell from 130 to 98, and no further blood appeared in the stools. On September 11th, however, the pulse rose suddenly to 120, with the development of marked pallor, restlessness, and sweating. On the 12th, the patient vomited 700 c.c. of blood, preceded by the regurgitation of curdled milk; and blood also reappeared in the stool. Her condition became very precarious. She complained constantly of pain across the upper zone of the abdomen.

On September 20th, at 6 p.m., she was seized with a severe pain in the epigastrium, and became weak and faint. Blood was vomited, and later altered blood was passed in the stool. A direct transfusion of 250 c.c. was done. On September 22nd, there was a slight improvement. On the 24th, there was again blood in the stool. On the 26th, there was severe epigastric pain, with nausea, followed by the passage of a bloody stool. By September 29th, there was some improvement, but the stools remained bloody. The patient was given an injection of 20 c.c. of horse serum.

On September 30th, the blood count was 1,200,000 red cells; hæmoglobin 22 per cent. On October 1st, the pulse was very weak and rapid. The blood count was 1,400,000 red cells; hæmoglobin 23 per cent. A transfusion of 400 c.c. was followed by mild anaphylactic signs, namely, œdema of the face and eyelids. On October 3rd, the blood count was 2,700,000 red cells. On October 4th, 2,240,000 red cells; hæmoglobin, 30 per cent. At 8.30 a.m. a third transfusion of 425 c.c., was performed. At 4.30 p.m. the patient complained of severe pain in the right lower axilla. The pulse became barely palpable. She vomited 250 c.c. of blood at 11 p.m.

On October 5th, at 9 a.m., laparotomy was performed. A moderate amount of thin fluid blood was found in the abdominal cavity. There were adhesions between the right lobe of the liver and the anterior parietes. Wherever recent adhesions were separated, there was oozing of thin blood, which showed no tendency to coagulate. The gall bladder was tremendously distended, and on being opened was found to contain a mass of blood clot. There was no evidence of ulcer of the stomach or duodenum; these findings confirming the original hypothesis, that the source of the bleeding was the liver, and that the blood had found its way into the bowel through the hepatic ducts.

The patient died at 4 p.m. on October 6th.

Autopsy was performed on the same evening, and showed, in addition to fracture of the fourth, fifth, sixth, seventh, and eighth ribs near their angles, with laceration of the parietal pleura, and the presence of 600 c.c. of blood-stained fluid in the right pleural cavity, an extensive laceration of the right lobe of the liver, communicating in its depths with the right main inter-hepatic bile passage by an opening 5 cm. in length. Careful study failed to reveal injured blood vessels of any size in the zone of laceration. The extra-hepatic passages were intact.

The striking clinical features of the case are:

1. The occurrence of a large quantity of blood in the stool and vomitus, as a result of injury to the liver.

2. The appearance of this hæmorrhage six days after the original injury.

3. The recurrence of blood in the stool from the same source.

4. The effect of transfusion.

5. The clinical and post mortem evidence of the extreme fluidity of the blood, suggesting the development of true hæmorrhagic disease.

It has been conclusively demonstrated experimentally that prothrombin production is very greatly lessened in injury of the liver, whether the injury be due to the destructive action of a poison, such as chloroform, or to direct traumatism, as for example the deep cauterization of the liver. The well-known experiments of Pawlov and Bohr, which demonstrated the absence of coagulation in animals in which the abdominal circulation had been isolated, as well as the work of Doyen and his pupils upon the effects of injuries to the parenchyma of the liver, leave little doubt that the causes of prothrombin-antithrombin disturbances leading to the development of hæmorrhagic disease are to be traced to the liver itself. I am inclined to believe that the case presented is one in which hæmorrhagic disease developed as the result of extensive injury to the liver. The beneficial effects of transfusion would also lend support to Whipple's contention that, in cases of true hæmorrhagic disease, the one hope of benefit is in the practice of direct transfusion.

ANTHRAX OF FACE

By Chas. K. P. Henry, M.D.

AND

William J. Scott, M.D.

IN this section of Canada, anthrax, or malignant pustule, in man is sufficiently uncommon, and its early recognition is so imperative, that I feel justified in presenting this case to the society.

Mr. M. C., aged forty-one years, was a skilled workman in Lyall's munition plant, where he acted as inspector of copper linings of shells. He was first seen by me in the early morning of July 26th, 1917, in consultation. The local condition began as a "blind boil with a yellow centre" over the left mandible on July 19th. At this time there was but little swelling of the face. On the following day he was feverish and was home from work. The area involved was larger, more swollen, reddened and there was surrounding cellulitis. There was considerable swelling beneath the jaw, and under hot fomentations this swelling decreased. On September 21st, he was quite ill. The preceding day the local area was "lanced and injected". On this day he had a rigor and there were two such later.

During the 24th and 25th he had considerable abdominal pain and some vomiting. This epigastric pain persisted and was constantly present and was his main complaint during the last two days of his illness.

On September 26th, at 8 a.m., when seen by me he was moribund. He had had a collapse during the preceding night and was pulseless and showed marked cyanosis. He was short of breath and was complaining of epigastric distress. Energetic stimulation was given and he was admitted to the Montreal General Hospital at once. On the left cheek over the mandible was a typical lesion of anthrax. This was about the size of a fifty cent piece and was raised above the surrounding skin. There was no cellulitis or swelling about it and no glandular enlargement was

Read at a regular meeting of the Montreal Medico-Chirurgical Society, Nov. 2nd, 1917.

made out. The centre of the lesion was depressed, dry, necrotic, and just external to this were grouped in a circle areas of black necrotic looking tissue. Externally again the edges of the lesion were more raised, bright red in colour and showed a scallop-like appearance similar to a cock's comb. The growth was moveable on the underlying tissues and was neither painful nor tender. There was little swelling of the face tissues. His arms were cyanosed to the elbows and his extremities were cold. His intelligence was keen and he was conscious to within a moment or so of death, which occurred at 2 p.m. the same day.

After his admission to the hospital salines were given and all forms of stimulation employed. In addition 10 c.c. of anthrax serum was injected into a vein at the left elbow, and 10 c.c. given subcutaneously. This vein gave thick, very slowly flowing blood and it was apparent that there was hardly any circulation in the peripheral vessels.

The photograph shows the lesion as it was two hours before death.

The abdomen was full, distended, tender to pressure, and he constantly complained of pain here.

Direct smears taken from the surface of the growth showed numerous anthrax bacilli.

The source of infection was not found. No other cases occurred in the munition plant and none at home. He owned a horse which had been attended to by him for a sore leg and a veterinary inspection was made of this animal, and the inspector reported there was no evidence of anthrax. No cultures were taken, as far as I could ascertain, as the horse was well a few days after the patient's death.

In the last few years a couple of cases among soldiers have occurred in the Montreal General Hospital, with recovery.

This patient developed septicæmia. The local condition was undoubtedly subsiding during the last two days of life.

Early excision with serum therapy seems to be the best treatment.

The bacteriological and pathological findings were elaborated in the Pathological Department of the Montreal General Hospital.

Post-mortem findings. The focus of infection, as described by the author during life, showed little change at autopsy.

In explanation of the gastro-intestinal symptoms, we found a text-book picture of mycosis intestinalis. The lesions were fungus like, firm, dark red or grey in colour, with occasional areas of

necrosis. They were found throughout the small bowel, at intervals of about six inches, and projected into the lumen. The largest was about the size of a hen's egg, the smallest, one c.m. in diameter. In the pyloric portion of the stomach, we found three or four similar lesions, and a few were present in the great bowel.

The spleen was not markedly enlarged, although it was of the septic type, soft, dark red, and weighed two hundred grams.

Cultures were taken from the heart's blood, spleen, and from one of the lesions in the bowel. All showed a gram positive rod with the morphological and cultural characteristics of *B. anthracis*, and agreeing in all respects with the organism which was isolated from the pustule and blood culture taken upon admission to the Montreal General Hospital.

Sections of tissue from the intestinal and stomach lesions showed great numbers of short plump rods with straight cut ends, irregularly distributed and occurring in short chains or singly. The most striking feature in the inflammatory reaction is the intense congestion of the vessels, with smaller and larger hæmorrhages in places. The cellular exudation showed a decided predominance of polymorphonuclear leucocytes. The sections from the pustule, on the other hand, showed few bacteria, and little œdema. The exudation of serum in the gastro-intestinal lesions was a marked feature.

The patient had malignant pustule, with mycosis intestinalis and anthrax septicæmia, the organisms being demonstrated in the circulation by blood culture taken the day of death and confirmed at post mortem, but whether the organisms reached the gastro-intestinal tract from the blood stream, or by way of the mouth, producing the remarkable picture above described, is a question. Clinically the malignant pustule showed marked improvement, and histologically, the inflammatory process was decidedly subsiding, so that we feel the mycosis intestinalis was a result of the organisms, or spores, being carried into the mouth from contaminated fingers.

Editorial

DR. THEODORE C. JANEWAY

IT is a tragic, though significant event, that America's foremost physician should have been among the first of his countrymen to succumb to the hardships of the great war.

The promptitude and efficiency with which the American medical professsion responded to their country's need was one of the most striking features of the mobilization, while the many units that have now long done duty in France are abundant evidence of their success.

On the outbreak of war, Dr. Janeway's offer of his services was readily accepted, and though eager for work in France, he took on his duty in Washington uncomplainingly. There, as advisor on cardiovascular conditions and hospital equipment, at the Surgeon-General's office, he devoted himself with an energy that was his characteristic, and with untiring zeal that helped to impair his vitality, ultimately contributing to his fatal illness. He died of lobar pneumonia on December 27th, 1917, after six days, and at the early age of forty-six years.

His career was a brilliant one, marvellously rich in achievement—a hectic effort to follow an ideal of life—full of study, industry, zeal and stimulation, and yet with a simplicity devoid of any sordid interest.

A graduate in the Yale Scientific School in 1892, he followed the medical course at the College of Physicians and Surgeons, New York, taking his medical degree in 1895. An instructor in medical diagnosis in New York University for the following ten years, he next became associate, and finally professor in his own medical school in 1909, till he was called to Baltimore in 1914, as Professor of Medicine and

Chief of Staff in the Johns Hopkins Hospital and Medical School.

Throughout these promotions his interests were wholly in medical research—on its pathological and chemical sides—for he was trained in laboratory methods as few men of his time.

His father's mantle fell easily on the son's shoulders, for already in his declining years of activity the older diagnostician had conferred on him an inheritance of knowledge and wisdom that enabled his son to stand among the ablest of American clinicians.

The younger Janeway had acquired proficiency based on arduous work, long laboratory training and a vast experience, made all the richer through keen powers of observation, a marvellous memory and receptivity which enabled him to garner the benefit of an intimate association with his father.

While not a prolific writer, Dr. Janeway contributed valuable works on scientific medicine. He was among the pioneers in practical application of blood pressure estimations, and as a student of metabolism he organized a staff of workers whose literature on Diabetes, Gout, and Nephritis is of the highest importance.

He wrote much on Cardiovascular disease and Therapeutics, and was an authority second to none on the subject of Nephritis.

It was greatly due to his influence that chemical research in the clinics was systematized and organized, and that the study of metabolism became a feature of clinical therapeutics in this country. Thanks largely to his fostering influence the large metabolism clinic at the Royal Victoria Hospital at Montreal was established and completed, and it is a pleasant memory to all concerned to recall his enthusiasm at its equipment and organization.

Particularly gifted, too, as a teacher, his lectures were masterpieces of lucidity and careful preparation, so much so, that individually they might serve as monographs of the subject dealt with.

The question is sometimes asked, "By what is a man remembered after he has gone?" The answer is, "By the service he has rendered, and by the love he has expended." How peculiarly applicable is this answer to him whose loss we all mourn! For, his service lay, not in the publication of treatises on clinical medicine, and not in the beneficent practice which he so skilfully carried on, great and invaluable as these all were—but still more in the inspiration that he was to the whole medical profession, in the ideals of intellectual accuracy and integrity to which he dedicated his life, and which remain as a perpetual inheritance, enduring in influence. As a result he has made his name a synonym in the medical world for diagnostic thoroughness, and truthful interpretation.

Who of us can forget him, who does not feel a new reason for fighting with fresh consecration the battle of progressive medicine, now that this brave and valiant soldier in the cause has laid down his arms?

REPORTING OF ACCIDENTS FROM LOCAL ANÆSTHETICS

A LETTER bearing this heading from the Council of Pharmacy and Chemistry of the American Medical Association is published in this issue. In the experience of many large hospitals where newer local anæsthetics as novocain, anocain, stovain, tropococain, are used extensively by skilful anæsthetists such accidents are practically nil. The fact that such a responsible body as the Council of Pharmacy and Chemistry feels the necessity of issuing a circular on the subject shows, however, that accidents do occur. Since this is the case it is certainly most important that all such should be reported with full details as to dosage, the condition of the patient, and mode of administration. In this way serious errors in the handling of these drugs may be corrected.

WAR NEPHRITIS

AMONG the various conditions that have arisen during the present war engaging the attention of the medical mind, perhaps none has excited deeper or more widespread interest than trench nephritis. Previous to the conflagration of 1914 the kidney both in health and in disease was being investigated by so many representative men of all schools from the standpoint of function and morbid changes, that when the opportunity offered by the incidence of disease in this war there was no lack of trained men to investigate carefully these interesting nephritic cases. Partly on account of the frequency of this affection which must be regarded as in excess of nephritis in civil life and partly on account of the type of the disease seen during the present war, trench or war nephritis has won its name.

Just what percentage of the total number of those ill, or of those in the field, is invalided on account of this particular type of kidney disease is most difficult to estimate, yet reports of so many groups are constantly coming forward both from the British Expeditionary forces and the French forces as well as from the German and Austrian armies, that it may be estimated with certainty that the number of those already ill has reached thousands. From all available statistics, after a careful elimination of certain cases of chronic renal disease, as well of those cases which have come to be known as "fatigue albuminuria", it appears there yet remains so large a number of men presenting the symptom complex of renal disease, that nephritis in this war is unprecedented in military history with but one exception—that which occurred in the American civil war when 14,000 of the northern armies were invalided.

The first cases were recognized in the British Expeditionary forces in the spring of 1915 and later in the French and other armies of the north, while numbers of cases were reported

among the Mediterranean forces. Albuminuria, casts, and dropsy afford the evidence for a clinical diagnosis of nephritis under any circumstances. There is no lack of such evidence in war nephritis yet these with certain other features show considerable departure from ordinary nephritis or nephritis seen in civil life. Bradford points out that there are two outstanding features of war nephritis—the rapid subsidence of dropsy and the remarkably low mortality considering the severity of the uræmic attacks.

Those who have regarded a large number of these cases describe dropsy of brief duration, usually clearing up in one or two weeks, dyspnœa in the early stages of the disease, even at the onset, bronchitis of such frequency as to render it doubtful whether "it should be considered as a complication or as one of the normal phenomena of the disease". Fever is early and often of a relapsing type. The urine in all cases contained albumin and often blood. Albumin disappeared in a few weeks—in some after fourteen weeks (Brown) or in others only after five or six months from the onset. Brown points out that the urine, while the disease was acute, in certain instances was markedly increased. He failed to see "the extreme reduction in quantity such as is common in civil practice". Although a tendency to relapse has been remarked in a number of cases, yet the prognosis is favourable in the majority. The mortality of 0·3 or 0·4 per cent., according to Bradford's estimate, is regarded as rather too low by others who report 2 per cent. or 3·5 per cent. of deaths. Time must decide these both points, for prognosis and mortality rate require reports on thousands of cases over several years. While the cases examined post mortem afforded the evidence that pathological changes are those best described as an acute glomerulo-nephritis or a glomerulo-tubular nephritis—yet the causative agent is still a matter of much speculation.

From the fact that the winter of 1914 and 1915 was cold and not a little privation was experienced, the outbreak of the disease in the early spring was attributed to exposure to cold.

The persistence of the disease into the summer, the illness of many of the troops not so exposed, the few cases (three) among the Indian troops, quite unaccustomed to that climate, are urged against this view. Again syphilis and typhoid inoculations individually have been advanced by way of explanation. Diet, too rich in proteins, metallic poisons such as lead and tin, have been considered among the possible causes. An unusual scarlatinal infection is also in the list already quite long, of factors accounting for the wide-spread incidence of nephritis.

Those who maintain the theory of an infective origin seem to hold the strongest ground. Yet, notwithstanding many cultures and microscopic examinations, no organism has been found. The *spread* of the disease from British Expeditionary forces to French forces, the increase of the number of cases, and again the decline in the number which is being at present observed, are features strongly resembling epidemics, already demonstrated as due to infection. Experimental work done with the urine of nephritic subjects by Dr. Mackenzie Wallis shows that an illness may be induced in rabbits and monkeys eight days after injecting them, thus excluding a toxic cause, and suggesting a "filter-passer" or an ultramicroscopic agent, for if the urine had been previously heated to 55°C., no illness occurred.

Dr. Wallis suggests that cold and exposure may play a part as predisposing to the disease, but that the degree of affection of the glomeruli, the chemical tests, and the post mortem evidence point to an infective origin.

NEW YEAR'S HONOURS TO SIR ANDREW MACPHAIL AND OTHER CANADIANS

THE list of New Year's honours contains the name of Major Andrew Macphail, C.A.M.C., editor of the JOURNAL, upon whom the distinction of Knight Bachelor has been conferred by His Majesty the King for services at the front and in recognition of his distinguished literary achievements along scientific and patriotic lines.

Major Sir Andrew Macphail was born at Orwell, Prince Edward Island, in 1864. He is a graduate of McGill University and was appointed professor of the history of medicine in that university in 1906. He is a member of the Royal College of Surgeons and a Fellow of the Royal Society of Canada; author of several books, plays, etc., and editor of the *University Magazine* and of this JOURNAL. although for almost two years now he has been overseas. In April, 1916, Sir Andrew offered his services for duty overseas for the duration of the war and was given a commission as Lieutenant in the Canadian Army Medical Corps and attached to the staff of No. 6 Field Ambulance, under the command of the late Lieutenant-Colonel R. P. Campbell, who met his death attending to the wounded in 1916.

The whole of 1916 and part of 1917 was spent by Sir Andrew Macphail on the battlefields of Flanders and France, including that of Vimy Ridge. He was promoted to the rank of captain on the field, and in June, 1917, was given his majority and attached to Canadian Headquarters in London. The same month he was chosen to deliver the Cavendish Lecture before the London Medico-Chirurgical Society. The only other Canadian who has enjoyed this distinction is Sir William Osler who was Cavendish Lecturer in 1899.

In addition the list contains the names of the following members of the Canadian Army Medical Corps:

Companion of the Bath: Colonel Frederick Gault Finley, of Montreal, chief medical adviser at Canadian Headquarters, London.

Commander of St. Michael and St. George: Colonels Kenneth Cameron, of Montreal; Wallace A. Scott, of Toronto; George S. Rennie, of Hamilton; and Walter Langmuir Watt, of Winnipeg. Lieutenant-Colonel John Andrew Amyot, professor of hygiene in the University of Toronto.

Distinguished Service Order: Lieutenant-Colonel (temporary Colonel) Charles A. Peters of Montreal; Lieutenant-Colonels James E. Davey of Hamilton; Charles H. Dickson of Springfield, Nova Scotia; James Fraser of Walkerton, Ontario; Thomas McC. Leask of Moose Jaw; Thomas J. F. Murphy of St. Jean d'Iberville, Quebec. Major (temporary Lieutenant-Colonel) Clifford Hamilton Reason of London, Ontario; Majors (acting Lieutenant-Colonels) Alfred T. Bazin of Montreal, Percy G. Bell of Winnipeg, James J. Fraser of Walkerton, Ontario; and Major George S. Mothersill, of Winnipeg. The decoration has also been conferred upon Captain Gordon McLarty Royal, who was formerly with the C.A.M.C.

The Royal Red Cross of the First Class has been conferred upon Matrons Myra Goodeve, Janet McDonald, Helen Shearer, Jean Urquhart, and Nella Wilson.

The Royal Red Cross of the Second Class has been conferred upon Nursing Sisters Annie Baillie, Elizabeth Best, Mabel Bruce, Isabel Connor, Winnifred Fray, Margaret Galbraith, Sarah Heaney, Elizabeth Martin, Margaret McCort, Annie Stirling, and Ethel Upton.

Colonel H. S. Birkett, C.B., M.D., has been elected Vice-President of the Oto-logical Section of the Royal Society of Medicine. This additional honour was conferred upon him prior to his leaving the overseas service which he has conducted with so much credit to himself and the Canadian Army Medical Service.

A NUMBER of important questions were discussed at the Social Welfare Congress held in Winnipeg on November 22nd, 23rd, and 24th last. Keen interest was manifested in the subjects under discussion and the addresses given were heard with the greatest attention. The speakers all emphasized the importance of preventive measures as the most effective means of improving social conditions. Dr. T. A. Mathers, who in the absence of Dr. Stewart spoke on Tuberculosis, said that children, who were particularly susceptible to that disease, should be removed from an environment in which they were exposed to infection; adults were not so susceptible but overstrain, especially when coupled with underfeeding, frequently caused a latent infection that had probably been contracted in childhood to break out into active disease; advanced cases of tuberculosis should be quarantined, routine examination of adults as well as school children should be instituted, and better public health laws secured; and finally, were poverty removed, tuberculosis would soon disappear. Dr. Gordon Bell and Dr. Fraser, speaking on venereal diseases, referred to the importance of accurate knowledge of facts concerning these diseases and of organization to deal with the facts when known. There should be registration, private but not necessarily secret, of cases of such disease and arrangements should be made for the quarantine of those actively infective. The speakers also advocated the establishment of clinics for the treatment of patients, which in necessitous cases might be given free of cost.

Mr. A. M. MacDonald, superintendent of Neglected Children for the Province of Alberta, referred to the difficulty of providing proper care for children born out of wedlock. He thought that better results would be obtained if such children were placed in suitable foster homes whenever possible rather than in public institutions. They should not be left with the mother unless she was anxious to keep them. The name of the father should be demanded in

registration and the child, if need be, should take the name of the father and be supported by him.

Mr. R. B. Maxwell, president of the Great War Veterans Association, and Sergeant Downs, the vice-president, both spoke of the need for the utmost consideration in the public attitude towards the returned soldier. The greatest difficulty was experienced by the men upon their return in settling down to routine work; they were restless and many of them when they began to work were still suffering from the effects of the experiences they had been through; moreover the strict discipline of military life had unfitted them to think and act for themselves and it naturally took them a little time to accommodate themselves to the return to civilian life.

In a discussion of the food problem, Mr. E. McGrath, secretary of the Bureau of Labour, stated that whereas since the beginning of the war the price of groceries had increased 63 per cent. and the cost of meat 34 per cent., in the case of over five thousand men representing twelve trades the average increase in wages had been only 14 per cent.

The number of Canadian soldiers who have been blinded in the war up to the present time is fortunately small, about thirty-four altogether. The greatest interest has been shown by the general public in the welfare of these men, and, moreover, application has been made to the government by several institutions for the blind for permission to care for and train blinded soldiers in this country instead of in England. The training given at St. Dunstan's Hostel in London, however, is so satisfactory and has proved so beneficial from every point of view that it has not been thought advisable to establish in Canada a training centre for soldiers who have become blind, and the men themselves have expressed their complete satisfaction with the present arrangement.

A report on the work done at St. Dunstan's has been prepared by Colonel Murray Maclaren, C.M.G., and has been made public in order that Canadians should understand that soldiers who have been so unfortunate as to lose their sight receive every care and the best possible training. After a full investigation of the work of the institution, Colonel MacLaren states that St. Dunstan's Hostel is an admirably organized and thoroughly well conducted establishment. Regular institutional training is carefully avoided and the word institution is not used, every effort being made to introduce a cheerful and hopeful spirit into the lives of the men and to encourage them to regard themselves as normal people who cannot see. Two officers and eight Canadian soldiers have already passed out of the hostel and one officer and twenty-three soldiers are now undergoing training there. No obligation to remain at the hostel is imposed upon Canadians, who, as soon as their wounds are healed, are sent there and given the opportunity of deciding for themselves whether or not they will remain. The course of training extends over a period of from eight to twelve months, varying somewhat according to the nature of the occupation selected and the adaptability of the pupil. The training is supervised by carefully chosen and capable instructors. The facilities for training are excellent and the aim is to make the men thoroughly proficient in their occupations. Before the course is finished the weak points which have been carefully noted are corrected and the man only leaves the hostel when he has become thoroughly proficient. Those trained in massage are required to pass the examination of the Incorporated Society of Trained Masseurs. The principal occupations taught are massage, secretarial work including typewriting and shorthand, telephone operating, cobbling, mat-making, basket-making, joinery, and poultry-farming, and every man receives instruction in Braille, typewriting and netting. Colonel Maclaren quotes Sir Arthur Pearson, the head of St. Dunstan's, as saying that the majority of the men who

have been trained there have been able to obtain more remunerative work than they had before they enlisted.

Among the soldiers who have been treated in the institutions established by the Military Hospitals Commission from the beginning of the war up to September 30th, 1917, there have been 2,364 cases of tuberculosis, 903 from the various camps in this country and 1,561 from overseas. It is estimated that in addition to these, about 540 cases were still in England at that time so that the total number of tuberculous soldiers in the Canadian Expeditionary Force reported up to the end of September was approximately 2,904. Up to the present eight sanatoria have been established by the Military Hospitals Commission, and a large proportion of the beds in several other sanatoria are reserved for military patients.

An order-in-council has been passed by the Alberta Government which provides for the transference of matters connected with public health from the department of agriculture to that of the provincial secretary. The various branches of public health work will thus be coördinated and, as a step towards the establishment of a separate department of public health, the new arrangement will be received with satisfaction by the profession of Alberta. Matters concerning the establishment of rural hospitals will also be placed under the direction of the Provincial Secretary, instead of being, as formerly, in the Department of Municipal Affairs, and, therefore, the Board of Health, the Department of Vital Statistics, and the establishment of rural hospitals will now all be directed by the Hon. George P. Smith, the Provincial Secretary. It is announced that more effective measures will be taken in future in regard to public health matters and one feels sure they will be productive of good results.

An important announcement was made by the Honourable J. R. Boyle, Minister of Education in the province of Alberta, on the occasion of the annual conference of Provincial School Inspectors early in January. Mr. Boyle said that during the present term it was probable that a couple of doctors and nurses would be employed by the Department of Education to begin the medical inspection of children in rural schools. The most efficient method of conducting such an examination would have to be learnt from experience and the assistance of school inspectors was earnestly desired, both by practical advice and by arousing public interest in the work. The medical inspection of teachers was also included in the new departure contemplated by the Department of Education.

The success of the medical examination of children in the larger schools throughout the Dominion as a preventive measure against disease, has made any comment upon the advisability of medical inspection superfluous. Up to the present, however, it has not been found possible to extend the work to include schools in rural districts, although the matter is now under consideration in the province of Ontario; if, therefore, the plan spoken of by Mr. Boyle is put into effect during the present term, the credit of being the first of the provinces to inaugurate such a comprehensive system of medical school inspection will fall to Alberta.

The Order-in-Council passed on November 15th, last, provides that the Food Controller may from time to time by written order prescribe the maximum amount of profit or the maximum price (or both) to be charged on the sale in Canada, or within any part of Canada designated by the Food Controller, of any food or foods or of any food product or food products designated by the Food Controller. In accordance with this, an order was issued by the Food Controller on December 27th, that from and after the first day

of January, 1918, and until further notice, milk distributors shall not charge more for milk sold by them than the actual cost of the milk delivered at their premises and, in addition to such cost, 5·25 cents per quart in the province of British Columbia, Alberta, Saskatchewan, and Manitoba, and five cents in the provinces of Ontario, Quebec, Nova Scotia, New Brunswick, and Prince Edward Island; that no retail dealer shall charge a higher price for milk than the price the milk distributors charge the consumers in the locality in which such retail dealer is carrying on business; and that if the cost of distribution is increased owing to an increase in the price of labour or otherwise, any distributor affected thereby, may submit evidence of such increase to the Food Controller and ask that the maximum amount herein prescribed for distributors in the province in which such distributor is selling may be increased.

As a means of increasing the food supply both for domestic consumption and for export to the Allies, farmers are earnestly requested by the Food Controller to increase the production of food animals and particularly of hogs. The tremendous importance of increasing the supply of food cannot be overestimated, and each farmer should look upon it as a national duty to increase his stock and to produce as much wheat as possible and thus "do his bit" by helping to feed our soldiers and those of our Allies.

The Medical Department of Queen's University has an Osler Club which was organized some years ago for the study of the history of medicine, and for the establishment of an historical museum. About two hundred rare books and many surgical antiquities have already been collected. A lay friend, at the request of Sir William Osler, donated a copy of "Vesalius's Anatomy" (1555).

For this session the Club is trying the experiment of

debates and the following subjects either have been debated, or are on the tapis:

Resolved that the gonococcus is as great a menace to society as the spirochæte;

Resolved that the microscope saves more lives than the scalpel and the pill;

Resolved that the Canadian tuberculosis sanatoria, as at present conducted, have outlived their usefulness.

The Club meets monthly, in the evening. Three members of the faculty act as judges. Practically all the fifth year students attend and the membership is limited to that year.

At the debate on the first of the above-named subjects, one of the members of the affirmative waxed eloquent on the ravages of the gonococcus, showing among other things, the large proportion of the gynæcologist's time that was actually taken up in repairing, as far as was possible, the mischief done by this organism. At the conclusion of his somewhat dramatic address he said, "I submit, Gentlemen, I respectfully submit, that the name 'gynæcology' should be changed to 'gonocology.'"

The question as to whether medical students should be called upon to join the combative forces has been settled by the following arrangement. First year students are liable for service if physically fit. With this exception, all students of medicine are exempted from combative service and are placed in a reserve corps to be called upon in case of military necessity. They will complete their medical training and upon graduation, if physically fit, will be given a commission in the Canadian Army Medical Corps. A similar arrangement has been made in regard to students of dentistry and veterinary science.

A branch of the *Société de Chimie Industrielle* has re-

cently been founded in New York. This, it is thought, will lead to a closer coöperation between British, American, and French chemists not only during the war but also in the struggle for supremacy in the fields of synthetic medicine, dye production, and other branches of applied chemistry that inevitably will follow the declaration of peace.

The following modifications in the course of medical instruction offered by the College of Physicians and Surgeons of Columbia University were suggested by the Dean of the College in his annual report, and will shortly be laid before the University Trustees: the addition of a fifth year to the regular medical course, the establishment of a diagnostic clinic where persons with moderate incomes may receive treatment at moderate rates, and the provision of additional systematic instruction for graduate students of medicine.

A study of deaths among industrial policy holders of the Metropolitan Life Insurance Company discloses the fact that the death rate from automobile accidents is now more than three times as great as it was in 1911, and that almost one third of the fatalities occur among children under ten years of age.

The Association

THE MEDICAL WEEK IN HAMILTON

WE are glad to be able to inform our members that Dr. H. Beaumont Small, of Ottawa, has accepted the Presidency of the Association for the coming year. After Dr. McKenty's resignation as president-elect, which was announced in our last issue, Dr. Small was selected to fill the vacancy by unanimous vote of the Executive Council, and we feel sure that this selection will receive the full approval of our members.

For upwards of twenty years treasurer of the Association, his close connexion with its administrative work renders him especially well fitted for the post of president. His executive ability is well known, he having served on many of the important committees of the Association. Personally there is perhaps no more popular member in our ranks; and we are certain that he will receive the hearty support of the Canadian profession in making the approaching Hamilton meeting, in spite of war times, the most successful on record.

Dr. Small has already entered energetically upon the work of his office, and has promised us a communication on the subject of the meeting for our next issue.

In the meantime we are assured that local arrangements at Hamilton are progressing most satisfactorily.

The president of the Ontario Medical Association, Dr. John P. Morton, and his very able and energetic secretary, Dr. J. Heurner Mullin, with their committees, have already arranged many important details of the meeting.

We hope to be able to publish a preliminary programme in our next issue.

Miscellany

Correspondence

REPORTING OF ACCIDENTS FROM LOCAL ANÆSTHETICS

CHICAGO, *January 15th*, 1918

The Editor,

CANADIAN MEDICAL ASSOCIATION JOURNAL,

Sir,—

THE Committee on Therapeutic Research of the Council on Pharmacy and Chemistry of the American Medical Association has undertaken a study of the accidents following the clinical use of local anæsthetics, especially those following ordinary therapeutic doses. It is hoped that this study may lead to a better understanding of the cause of such accidents, and consequently to methods of avoiding them, or, at least, of treating them successfully when they occur.

It is becoming apparent that several of the local anæsthetics, if not all of those in general use, are prone to cause death or symptoms of severe poisoning in a small percentage of those cases in which the dose used has been hitherto considered quite safe.

The infrequent occurrence of these accidents and their production by relatively small doses point to a peculiar hyper-sensitiveness on the part of those in whom the accidents occur. The data necessary for a study of these accidents are at present wholly insufficient, especially since the symptoms described in most of the cases are quite different from those commonly observed in animals even after the administration of toxic, but not fatal, doses.

Such accidents are seldom reported in detail in the medical literature, partly because physicians and dentists fear that they may be held to blame should they report them, partly, perhaps, because they have failed to appreciate the importance of the matter from the standpoint of the protection of the public.

It is evident that a broader view should prevail, and that physicians should be informed regarding the conditions under

which such accidents occur in order that they might be avoided. It is also evident that the best protection against such unjust accusations, and the best means of preventing such accidents consist in the publication of careful detailed records when they have occurred, with the attending circumstances. These should be reported in the medical or dental journals when possible; but when, for any reason, this seems undesirable, a confidential report may be filed with Dr. R. A. Hatcher, 414 East Twenty-Sixth Street, New York City, who has been appointed by the committee to collect this information.

If desired, such reports will be considered strictly confidential so far as the name of the patient and that of the medical attendant are concerned and such information will be used solely as a means of studying the problem of toxicity of this class of agents, unless permission is given to use the name.

All available facts, both public and private, should be included in these reports, but the following data are especially to be desired in those cases in which more detailed reports cannot be made:

The age, sex, and general history of the patient should be given in as great detail as possible. The state of the nervous system appears to be of especial importance. The dosage employed should be stated as accurately as possible; also the concentration of the solution employed, the site of the injection (whether intramuscular, perineural or strictly subcutaneous), and whether applied to the mouth, nose, or other part of the body. The possibility of an injection having been made into a small vein during intramuscular injection or into the gums should be considered. In such case the action begins almost at once, that is, within a few seconds.

The previous condition of the heart and respiration should be reported if possible; and, of course, the effects of the drug on the heart and respiration, as well as the duration of the symptoms, should be recorded. If antidotes are employed, their nature and dosage should be stated, together with the character and time of appearance of the effects induced by the antidotes. It is important to state whether antidotes were administered orally, or by subcutaneous, intramuscular or intravenous injection, and the concentration in which such antidotes were used.

While such detailed information, together with any other available data, are desirable, it is not to be understood that the inability to supply such details should prevent the publication of reports of poisoning, however meagre the data, so long as accuracy is observed.

The committee urges on all anæsthetists, surgeons, physicians, and dentists the making of such reports as a public duty; it asks that they read this appeal with especial attention to the character of observations desired.

Torald Sollmann, Chairman,

R. A. Hatcher, Special Referee,

Therapeutic Research Committee of the Council on Pharmacy and Chemistry of the American Medical Association.

Book Reviews

THE PRACTICAL MEDICINE SERIES. Volume III. The Eye, Ear, Nose and Throat. Edited by DR. C. A. WOOD, DR. A. H. ANDREWS and DR. G. E. SHAMBAUGH. Series 1917. Chicago: The Year Book Publishers. Price $1.50.

This little book is not an exhaustive treatise of any of the subjects with which it deals, but is rather a series of brightly written articles, some excellently illustrated, on the eye, ear, nose and throat. There is much in these articles not to be found in more pretentious works.

The treatment of the physiology of the internal ear, especially that part based on the work of Barany, is well done; it takes up much that is left undone in text-books of physiology. The volume can be heartily recommended.

THE PRACTICAL MEDICINE SERIES. Volume IV. Gynæcology. Edited by E. C. DUDLEY, A.M., M.D. and S. S. SCHOCHET, M.D. Series 1917. Chicago: The Year Book Publishers. Price $1.35.

This book justifies its place in a *practical* series; it is eminently deserving of that name. But it is a great deal more than merely the treatment of certain diseases peculiar to women; it enters into many considerations of a theoretical nature which necessarily underlie operative proceedings. It is a treatise to be widely read. The editorial notes are always valuable.

THE PRACTICAL MEDICINE SERIES. Volume V. Pædiatrics and Orthopædic Surgery. Series 1917. Chicago: The Year Book Publishers.

The portion on Pædiatrics has an excellent discussion on the subjects of the nutrition of children and on the common diseases to which infants and children are liable. The chapters on infant feeding are good and occupy the large part of the book which so vastly important a topic demands.

The surgical portion of the volume is a very practical treatment of a subject which has become, in a sense, a specialty—one more of the already large number of such.

Books Received

THE following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

OBSTETRICS, NORMAL AND OPERATIVE. By GEORGE PEASLEE SHEARS, B.S., M.D., professor of obstetrics and attending obstetrician at the New York Polyclinic Medical School and Hospital; and E. E. SHEARS, M.D. Second revised edition. 734 pages with 419 illustrations. Price $6.00. Publishers: J. B. Lippincott Company, Philadelphia, London and Montreal, 1917.

INTERNATIONAL CLINICS. A Quarterly of Illustrated Clinical Lectures and Especially Prepared Original Articles. Edited by H. R. M. LANDIS, M.D., Philadelphia, with the collaboration of CHAS. H. MAYO, M.D., and others. Volume III. Twenty-seventh series, 1917. Publishers: J. B. Lippincott Company, Philadelphia, London, and Montreal.

IMPOTENCE AND STERILITY, with aberrations of the sexual function and sex-gland implantation. By G. FRANK LYDSTON, M.D., D.C.L., formerly professor of the surgical diseases of the genito-urinary organs and syphilology in the medical department of the State University of Illinois. 311 pages. Published by The Riverton Press, Chicago, 1917.

GENITO-URINARY SURGERY AND VENEREAL DISEASES. By EDWARD MARTIN, A.M., M.D., F.A.C.S., professor of surgery University of Pennsylvania; and others. Tenth edition, 893 pages, illustrated with 422 engravings and 21 coloured plates. Price $7.00. Publishers: J. B. Lippincott Company, Philadelphia, London and Montreal.

DISEASES OF WOMEN. By HARRY STURGEON CROSSEN M.D., F.A.C.S., associate in gynæcology, Washington University Medical School. Fourth edition, revised and enlarged, 1125 pages with 800 engravings. Price $7.50. Publishers: C. V. Mosby Company, St. Louis, 1917.

LORD LISTER. By SIR RICKMAN JOHN GODLEE, Bt., K.C.V.O., M.S., F.R.C.S. 663 pages. Price 18/- net. Publishers: MacMillan & Co., Limited, London, New York and Toronto, 1917.

Obituary

FRANCIS WILLARD NAGLE, M.D.

IT is with great grief that we record the sudden death of Dr. F. W. Nagle at his home in Montreal on January 24th.

Dr. Nagle was found in his garage asphyxiated by the fumes from his motor exhaust. All efforts at resuscitation failed, and he died later at the Royal Victoria Hospital.

The late Dr. Nagle was born at Ferguson Falls, Ontario, thirty-five years ago, and was educated at Almonte, Ontario, and at Ottawa University.

He entered the medical faculty of McGill University in 1904, and graduated with honours in 1908.

The late Dr. James Bell, chief surgeon of the Royal Victoria Hospital, recognizing Dr. Nagle's ability, appointed him house anæsthetist to the hospital. The excellent quality of his work amply justified his selection and in the following year he was made chief anæsthetist—a position he held until his death.

In addition he was soon appointed lecturer in Anæsthetics at the university—and anæsthetist to the Montreal Maternity Hos-

pital. Devoting himself entirely to this branch of medicine, he became a member of the American Association of Anæsthetists and was the President of this important body at the time of his death. This in short is the academic and professional record of the late Dr. Nagle; it gives, however, but a very inadequate estimate of the quality of his work.

From the first he inspired not only his colleagues, but also the patients with absolute confidence in his skill, adaptability, and resource. These gifts were intuitive—he was a born anæsthetist. This was perhaps especially conspicuous in his dealing with children.

As evidence of the efficiency of his work, we can say truthfully that in his hands post-anæsthetic complications were almost unknown. He was a past-master in the administration of nitrous oxide and oxygen as an anæsthetic—an unusual accomplishment even among experts.

As a man Dr. Nagle had a great personality. This was especially exemplified by his great influence, both with the public and with our profession. His sympathy, insight, and kindness of heart, endeared him to all. None appreciated these qualities more than those with whom he was daily associated. Dr. Nagle will be sorely missed not only by the hospital he served so faithfully, his colleagues who had come to rely so much upon his skill, but especially by the nurses who were so kindly helped in their early training in the operating room.

The JOURNAL extends its heartfelt sympathy to the bereaved family.

DR. WILLIAM JAMES SCOTT, who died at the Montreal General Hospital on November 25th, last, was a missionary in China for some years; he returned to Montreal a few years ago and went into practice at Notre Dame de Grace. Dr. Scott was thirty-six years of age and was the son of Rev. E. Scott, D.D., of Montreal, editor of the *Presbyterian Record*; he was a graduate of McGill University of the year 1905. He leaves a widow and two children.

DR. CHARLES PELLETIER died at Montreal on November 26th. Dr. Pelletier was on active service in France with the St. Cloud Hospital and recently returned to Montreal.

DR. FRANK L. SWITZER, who died of pleuro-pneumonia at the Protestant General Hospital, Ottawa, on December 22nd, last, was well known throughout the Ottawa Valley where he had

practised for many years. He was born at Switzerville, near Napanee, in the province of Ontario, in 1864. His early years were spent at Carleton Place, Ontario, where he attended the public schools. In 1882 he took the degree of B.A. at Victoria University and afterwards entered Queen's University as a student in medicine. His medical course was completed at Trinity Medical College in 1891, and in 1892 he began to practise at Riceville. For the past thirteen years he had lived in Ottawa.

Dr. Murdo Sutherland died suddenly at Westville, Nova Scotia, on December 24th, last, in the eighty-fifth year of his age. Dr. Sutherland was born at Six Mile Brook in the province of Nova Scotia and served his apprenticeship as a saddler. He decided, however, to take up the study of medicine and received his degree from Harvard Medical College in 1871. He first went into practice at Sydney but within a few months removed to Westville, where he has resided ever since. Dr. Sutherland built up a large town and country practice and was held in high esteem. Of recent years he had been unable to continue his professional work but had enjoyed fairly good health. He leaves one daughter.

Dr. Richard Jones, of Cobourg, Ontario, died in December in the eighty-fourth year of his age. He was the son of a Methodist clergyman and was born in Clarke township in Ontario. He was educated at Albert College and graduated from the University of Buffalo in 1864, after which he took a post-graduate course in New York. Dr. Jones practised at Madoc, Port Perry, Toronto, and since 1901 at Cobourg. His widow and daughter survive him.

Dr. Stephen Ballard Pollard died at Toronto on December 28th, at the age of seventy-two years. He was born at Port Credit in 1846 and graduated in 1869 from the Toronto School of Medicine. Dr. Pollard had lived in Toronto for over forty years and until a few years ago had a large practice there.

Dr. William Daniel Young, of Toronto, died on January 4th, in the forty-fourth year of his age, after a week's illness. He was born in Ottawa and was the son of Rev. Joseph Young. Dr. Young graduated in Arts from Toronto University in 1897 and in medicine in 1902. For the next few years he took charge of the Department of Chemistry at the Technical School, Toronto, and subsequently went into practice in the east end of Toronto. There

he worked indefatigably, largely among the poorer residents and soldiers' families by whom his loss will be keenly felt. He leaves a widow and four little daughters.

Dr. N. Shacknove, a Jewish physician and druggist in practice at Whitney Pier, Nova Scotia, was found dead in his office on the morning of December 20th. Dr. Shacknove went to Halifax to give assistance after the recent disaster and the dreadful scenes he witnessed there seem to have preyed upon his mind to such an extent that he determined to end his life. Dr. Shacknove was well liked by his patients and enjoyed a large practice. He was about forty years of age and leaves a widow and one child.

Dr. George Baptie, of Ottawa, died on January 5th, in the seventy-fourth year of his age. He was born at Dunham, Ontario, and graduated from Trinity Medical College in 1875. Dr. Baptie practised in Ottawa and had been coroner there for some years. His failing health made it necessary for him to give up his professional duties a few months ago.

News

MARITIME PROVINCES

As the Rockhead Isolation Hospital at Halifax was so severely damaged at the time of the explosion as to be unfit for use, the Oxford School building has been converted into a hospital for infectious diseases. The Woegwoltic Club, formerly the sporting centre of Halifax, has also been converted into a hospital.

Smallpox is still prevalent in certain districts in the provinces of New Brunswick and Nova Scotia. At the end of December fifty-four cases were reported from New Brunswick and at Joggins Mines, near Amherst, Nova Scotia, thirty cases were reported at the beginning of January; a number of cases also occurred at Maccan in the same locality. The presence of smallpox in the counties of Kent, Northumberland and Restigouche in New Brunswick made it inadvisable for a time to call men to the colours from those counties. Up to January 21st, one hundred and forty cases had been reported from these counties.

During the year 1917 the contagious diseases reported in Fredericton, New Brunswick, were; diphtheria, thirty-four cases; scarlet fever, five cases; measles, twenty-eight cases, typhoid fever, twenty-five cases.

Conditions in the hospitals in Halifax are gradually becoming more normal. The question, however, of providing separate accommodation for patients suffering from tuberculosis is at present exercising the authorities. No provision has been made by the city for the care of such patients, as tuberculous cases in the past have been sent to the Hazlewood Sanatorium.

Dr. M. D. Morrison, of Dominion, Nova Scotia, has been appointed chief medical officer of the Nova Scotia Workmen's Compensation Board, the appointment to date from the first of this month. Dr. Morrison has been colliery doctor at Dominion since 1897.

ONTARIO

The following cases of communicable disease were reported in the province during the year 1917: measles, 7,795 cases, thirty-four deaths; diphtheria, 3,597 cases, 223 deaths; scarlet fever, 2,027 cases, thirty-eight deaths; whooping cough, 1,670 cases, fifty-four deaths; typhoid fever, 825 cases, eighty-three deaths; smallpox, 225 cases; infantile paralysis, 102 cases, eleven deaths; cerebro-spinal meningitis, 113 cases, sixty-six deaths.

During the month of December the cases reported were: measles, 667 cases, three deaths; whooping cough, 357 cases, six deaths; diphtheria, 369 cases, twenty-nine deaths; scarlet fever, 304 cases, six deaths; typhoid fever, 143 cases, eleven deaths; tuberculosis, 113 cases, seventy-six deaths; smallpox, sixty-five cases; infantile paralysis, two cases, one death; cerebro-spinal fever, seven cases, five deaths.

Dr. Craig has given up his position as superintendent of the Byron Tuberculosis Sanitarium in order to join the Army Medical Corps.

Dr. Wood has been appointed surgeon to the Lindsay jail in succession to the late Dr. Jeffers.

Dr. Edith Gordon, of Toronto, has been appointed assistant medical advisor of women students in Cornell University.

During the past year the death rate in Toronto was 11·8 per thousand, estimating the population at the conservative figure of 475,000. The number of deaths in Toronto have steadily decreased as a result of the efforts of the Board of Health, and the mortality rate for 1917 is lower than that of any city on this continent in 1916 with the exception of Los Angeles, which was 11·3 per thousand of population; the figures for 1917 are not yet available. Cases of typhoid fever are also becoming less numerous and in 1917 there were only 95 reported as compared with 181 in 1916 and 154 in 1915; the death rate from this disease in 1917 was 3·8 per 100,000. The mortality rate in 1917 among infants of less than one year of age was 79·3 per 1000 births, as compared with 93·9 in 1916. One hundred and seventy-two children of less than two years of age died from diarrhœa and enteritis during the past twelve months.

At the beginning of January it was reported that there were 107 cases of measles in London.

Dr. W. S. Dakin has been elected mayor of Kitchener.

A fire occurred in the east wing of the Water Street Roman Catholic Hospital at Ottawa on January 10th. At the time there were one hundred and sixty-three patients in the hospital, among them being twenty-one children. The patients were removed as quickly as possible to a place of safety but, unfortunately, four children, who were on the top floor of the building, and whose ages ranged from two to four years, lost their lives. A woman patient, who was safely removed from the burning building, afterwards died of shock. The main building of the hospital, which was built in 1884, escaped damage, the fire occurring in the east wing which was added in 1899.

Dr. A. Knox, of St. Mary's, has been elected president of the Perth County Medical Association.

Dr. J. W. Brien, of Essex, has been appointed to the British Canadian recruiting depot at Detroit, Michigan.

QUEBEC

An outbreak of typhoid fever has occurred at Hull in consequence of a breakdown of the chlorination plant early in December. Over a year ago the city was ordered by the Provincial Board of Health to instal a mechanical filtration plant for the treatment of the water supply; on the score of expense, however, the city council refused to do this and an action against the city, which is still pending, was brought before the superior court of the Province of Quebec. Upon the breakdown of the plant, the people were advised of the danger of an epidemic and were urged by the medical officer of health to boil all the water used for drinking purposes, but the advice in many cases was disregarded. It is estimated that there are over a hundred cases of typhoid fever now in the city and a number of deaths have already occurred.

MANITOBA

The following cases of contagious disease were reported in Winnipeg last November: diphtheria, two hundred and four cases, four deaths; diphtheria carriers, sixty-four; typhoid fever, seven cases, four deaths; smallpox, eleven cases; whooping cough, fifteen cases; mumps, eleven cases; measles, one case; tuberculosis, twenty-nine cases, twelve deaths.

A short course in public nursing was given to the nurses employed by the Provincial Board of Health in January. It was the first time a course of this nature had been given and the lectures were followed with the greatest interest.

SASKATCHEWAN

Announcement has been made by Dr. M. M. Seymour, the public health commissioner for the province, that in future cases of venereal disease will be classed as "contagious" and must be reported to the Commissioner. The physician in attendance is required to report the case within three days without stating the name of the patient. Should the patient fail to return for treatment within thirty days, however, the name of the patient in question will be communicated by the physician to the Commissioner of Public Health.

The following information was recently given by Dr. Seymour

in reference to infant mortality in the province of Saskatchewan. During 1916, exclusive of still-births, 1,470 deaths occurred among infants of less than one year of age, a death rate of 105·5 per 100,000 of population, or 76·3 per thousand births. In England and Wales during the year 1915 the infant mortality rate was 110 per thousand births, and in the United States, according to press reports, 124 per thousand births, both of which are considerably higher than the rate in Saskatchewan. The death rate was lowest in the rural districts where it was 89·09; in villages it was 126, in towns 150·7, and in cities, 228·5. During the year 1915, sixty-five deaths occurred in child-birth in the province, the rate per 100,000 being, rural districts 7·7, villages 13·5, towns 14, and cities 10·8.

Warning the people of Saskatchewan against the danger of pneumonia during the winter months, arising largely through overheated rooms, Dr. Seymour states that in January, 1915, there were twenty-six deaths from this disease in the province, and in the same month of the following year fifty-one; in February, 1915, twenty-nine and in 1916, thirty-seven; in November, 1915, fifteen, and in 1917, nineteen; in December, 1915, thirty, and in 1916, thirty-seven.

During the month of November seventy-nine cases of contagious diseases were reported in Regina, comparing favourably with the same month in 1916, when 125 cases were reported. The number of cases of diphtheria, thirty-one, however, was greater last November than in November, 1916, when only thirteen were reported.

ALBERTA

An Order-in-Council has been passed by the provincial government, which gives authority for the transference of the Board of Health from the Department of Agriculture, to that of the Provincial Secretary.

The plans have been prepared for a military sanatorium which is to be built by the Military Hospitals Commission near Sarcee Camp. The institution, which will be built on the unit plan, when completed, will contain accommodation for seven hundred patients.

In the recent general election Dr. Michael Clark, member for Red Deer, received a majority of over one thousand votes.

A Resolution was passed in December by the Calgary Hospitals Board asking the city council at the next session of the legislature to request permission to increase the tax levied for hospital purposes. It was stated that the Board would close its financial year with a deficit amounting to fourteen thousand dollars.

Dr. Geraldine Oakley, of Toronto, has been appointed supervisor of medical inspection in the public schools of Calgary in succession to Dr. Leacock, who intends so devote herself to pathological work.

BRITISH COLUMBIA

The following appointments have been made by the Provincial Government: Dr. D. B. Lazier, of Prince George, and Dr. G. B. Thompson, of Fernie, to be coroners; Dr. R. G. Stevenson, of Quatsino, to be medical health officer for Quatsino Sound District and medical inspector of schools at Quatsino and Port Alice. To be medical health officers: Invermere districts, Dr. P. Turner; Grand Forks, Dr. W. Truax; Phoenix district, Dr. D. L. Smith; Bella Bella district, Dr. G. E. Darby; Parksville district, Dr. H. E. Langlis; Lytton, Hope, Yale and surrounding districts, Dr. H. R. T. Fort.

The annual convention of the North Pacific Surgical Association took place at Victoria in December, when a number of interesting papers were read, among them the following: "Perforated gastric ulcer," by Dr. A. O. Lee of Seattle: "Some of the benefits of gastric lavage with report of illustrative case of general peritonitis," by Dr. Park W. Willis of Seattle; "So-called neurasthenia from surgical standpoint," by Dr. W. H. Riggs of Vancouver; "Operative treatment of fractures," by Dr. Charles D. Hunter of Tacoma; "Bone transplants," by Dr. Milton G. Sturgis of Seattle. The next meeting of the Association will be in Seattle under the presidency of Milton G. Sturgis. The other officers elected for the present year were: first vice-president, Dr. E. F. Tucker, of Portland, Oregon; second vice-president, Dr. George Gordon, of Vancouver; secretary-treasurer, D. R. D. Forbes, of Seattle; councillor, Dr. A. Raymond, of Seattle.

ARMY MEDICAL SERVICES

THE list of appointments to the new Order of the British Empire, published on January 9th, contains the name of COLONEL R. D. RUDOLF, C.A.M.C., of Toronto, who has been gazetted Commander to the Order. Colonel Rudolf therefore enjoys the distinction of being the first Canadian medical man to be appointed to the Order of the British Empire.

THE Cross of the Legion of Honour has been awarded by the French Government to COLONEL GEORGE EMILE BEAUCHAMP, officer in command of the Laval University Hospital Unit.

THE Distinguished Service Order had been conferred upon CAPTAIN H. G. YOUNG, C.A.M.C., in recognition of his gallantry and devotion at the battle of Passchendaele.

THE Distinguished Service Order was conferred upon Captain Roderick Gordon, R.A.M.C., by the late General Maude on October 10th, the ceremony taking place on the battlefield near Remedai, Mesopotamia. Captain Bowman is a son of Professor J. H. Bowman of London, Ontario. He is a graduate of Western University and before joining the colours was in practice in South London.

THE bar to the Military Cross has been awarded to Captain Robert Harris, R.A.M.C., formerly of the C.A.M.C., who directed the evacuation of a heavily shelled dressing station crowded with patients.

THE Military Cross has been awarded to the following:

CAPTAIN GORDON M. JEPSON, C.A.M.C., of London, Ontario, for gallantry in action. Captain Jepson was attached to the staff of the Ontario Hospital at Orpington but, desirous of getting to France, joined a Field Ambulance and later No. 2 Stationery Hospital. About ten months ago Captain Jepson was appointed medical officer of the 24th Montreal Infantry Battalion.

CAPTAIN W. F. ABBOTT, C.A.M.C., of Winnipeg, for devotion to duty and for services rendered during the drive on Passchendaele Ridge. Captain Abbott is a gold medalist of the year 1916 of the Medical College of Manitoba University. He went overseas

in September, 1916, with the 100th Grenadiers and at present is attached to No. 9 Canadian Field Ambulance.

Captain James F. Matheson, R.A.M.C., of Owen Sound, Ontario, for conspicious gallantry and devotion to duty.

Captain H. Hepburn, R.A.M.C., who remained with his battery until its withdrawal, where his coolness, courage, and utter disregard for his personal safety greatly heartened all detachments.

Captain Archibald Laird, R.A.M.C., who attended the wounded for three days in a heavily shelled post and though slightly wounded in three places himself, carried on.

Major Howard Brown Jeffs, C.A.M.C., son of Dr. W. H. Jeffs, of Toronto. "For gallantry and devotion to duty. Although wounded himself, Major Jeffs tended the wounded under very heavy fire with great courage and determination. Later, being again wounded, he remained on duty until relieved."

Major Arthur Jones.

Captain Herbert C. Allison.

Captain Robert C. Gardiner.

Captain T. W. Herald.

Captain Harry W. Whytock.

Captain James MacGregor, R.A.M.C.

Captain Charles Fenwick, C.A.M.C., of St. John's, Newfoundland.

Promotions in the Canadian Army Medical Service: Assistant Director of Medical Services: Colonel J. A. Roberts, C. B. *vice* Lieutenant-Colonel J. McCombe.

To be Colonel: Temporary Lieutenant-Colonel J. M. Elder.

To be temporary Lieutenant-Colonel: Temporary Major A. C. Rankin.

To be temporary Major and retain the acting rank of Lieutenant-Colonel: Temporary Captain (acting Lieutenant-Colonel) A. Croll.

To be temporary Majors: Temporary Captains (acting Majors) J. J. Ower, R. J. McEwen, T. F. O'Hagan, M.C., R. H. Smith, S. G. Ross, M.C., R. H. M. Hardisty, M.C., H. Buck, M.C., G. W. Treleaven. M.C., H. E. Paul, J. W. Ross and A. H. Cameron-Smith, M.C.

To be temporary Majors: Temporary Captains F. S. Ruttan, J. M. Stewart, H. H. Burnham, H. B. Boyd, E. D. Hubbel, J. H. B. Bell, R. F. Flegg, J. L. Cock, G. O. Taylor, R. M. Luton, M.C., J. McW. Taylor, A. H. Taylor, M.C., W. Brown, M.C., D. Mc-

Lellan, J. W. Pilcher, N. G. Cooper, T. L. Butters, G. C. Hale, H. P. Wright.

To be acting Major while specially employed: Temporary Captain C. W. Waldron.

To be temporary Captains: W.E.Ainley, D. A. Warren, M.C., and temporary Lieutenant E. C. A. Crawford.

Lieutenant-Colonel S. H. McKee, C.M.G., who gave up a lucrative practice in Montreal and went to the front soon after the outbreak of the war, was recently promoted to the full rank of colonel. Colonel McKee is at present in command of the eye and ear hospital for soldiers at Folkestone, England. He took part in the Dardanelles campaign and also saw service on the western front, being created a Companion of the Order of St. Michael and St. George in recognition of his meritorious service. He is the eldest son of Mrs. S. H. McKee, of Fredericton, N.B.

The Meritorious Service Medal has been awarded to Sergeant-Major M. Duffey, C.A.M.C.

The Distinguished Service Medal has been awarded to Sergeant J. Watson, C.A.M.C.

The Military Medal has been awarded to Private Thomas Tebbutt of the Canadian Army Medical Corps for conspicuous gallantry and devotion to duty under shell and machine gun fire. Though twice buried by shells he continued to carry the wounded to a place of safety.

The Royal Red Cross of the Second Class has been awarded to Nursing Sister Alice Hogarth.

Lieutenant-Colonel Chester McGuffin, D.S.O., has been appointed Assistant Director of Medical Services. Lieutenant-Colonel McGuffin went overseas from Calgary with the Fourth Field Ambulance and was promoted to the command of the unit on the field. Major R. H. MacDonald, M.C., succeeds Lieutenant-Colonel McGuffin as officer in command of No. 4 Field Ambulance and has been promoted to be acting Lieutenant-Colonel.

Lieutenant-Colonel James Warburton, C.A.M.C., has been appointed to the command of the military convalescent

hospital which has been established at Government House, Summerside, Prince Edward Island.

Colonel Perry Goldsmith, C.A.M.C., of Toronto, has been appointed commandant of the new Officers' Convalescent Hospital at Matlock in Derbyshire, England.

Major Hart, C.A.M.C., of Winnipeg, has been appointed commanding officer of the sanatorium which has been established by the Canadian Medical Service at Maidstone in Kent, England

The following members of the Canadian Army Medical Corps were mentioned in a dispatch dated October 25th, 1917, from Lieutenant-General G. F. Milne, Commander-in-Chief, British Salonica Force: Lieutenant-Colonel G. Gow, Major J. W. G. Johnson, Captain (acting Major) D. A. L. Graham, and Captains W. A. Clarke and A. B. Schinbein.

Temporary Captains E. R. Edson and J. D. Maclean resign their commissions.

Lieutenant-Colonel J. E. Davey, D.S.O., who recently returned from the front, has been appointed medical officer at Brant House Military Hospital, Toronto.

The following members of the Canadian Forces have been mentioned by Sir Douglas Haig, in recent despatches.

Staff: Colonel A. E. Ross, C.M.G., C.A.M.C.

Lieutenant-Colonels (temporary Colonels) H. M. Jacques, D.S.O., C.A.M.C., C. A. Peters, C.A.M.C., R. P. Wright, D.S.O., C.A.M.C.

Canadian Army Medical Corps:

Lieutenant-Colonels R. J. Blanchard, J. E. Davey, C. H. Dickson, J. A. Gunn, J. Hayes, T. J. F. Murphy, F. W. E. Wilson.

Majors (temporary Lieutenant-Colonels) A. T. Bazin, J. N. Gunn, T. McC. Leask, C. H. Reason.

Majors (acting Lieutenant-Colonels) P. G. Bell, and J J. Fraser.

Majors D. J. Cochrane, G. S. Mothersill and S. Paulin.

Captains L. E. Clark, W. J. E. Mingie, G. W. Armstrong,

G. S. Clancy, G. M. Dale, G. A. McLarty, H. S. Moore, H. S. Sugars, C. W. Treherne and W. S. Wallace.
Lieutenant W. McL. Moore (Canadian Red Cross).
Quartermaster and Honorary Captain J. E. Tulloch.

CASUALTIES

Died on Service:

Lieutenant-Colonel John McCrae, C.A.M.C., of Montreal.
Captain R. S. Smith, C.A.M.C.

Wounded:

Captain James F. Matheson, C.A.M.C.
Captain W. J. E. Mingie, C.A.M.C.
Captain W. K. Turner, C.A.M.C.

The Albert Medal has been awarded to acting Q.M.S. James William Brown, R.A.M.C., Sergeant William Seymour of the Northumberland Fusiliers, and Privates Arthur D. H. Allan and James Cuthbertson, R.A.M.C., for heroism in February, 1917, when a serious explosion occurred on the French troopship *St. Laurent* at Malta. In spite of the terrific heat and the danger of a further explosion Brown persuaded a Maltese policeman to row him out to the burning ship. The latter, however, refused to go within thirty yards of the ship and Brown was obliged to return. He was then joined by the others. They rowed to the ship and were able to save three lives.

Canadian Literature

Original Contributions

The Canada Lancet, December, 1917:

Blood pressure in its practical aspects	J. Ferguson.
Dredging the canals of the abdominal nervous system by electricity to insure blood formation and prolong life	Sir James Grant.

Canadian Practitioner and Review, December, 1917:

The Canadian Army Medical Service	J. T. Fotheringham.
Health Insurance	C. J. Hastings.

The Public Health Journal, December, 1917:

The contribution of health insurance to improvement of the public health	M. M. Dawson.
Health insurance, the practice of medicine and public health	T. M. Rubinow.
Detection and isolation of diplococcus intracellularis meningitidis	R. A. Defries.
The influence of mental defectives on the public health	Helen MacMurchy.

The Western Medical News, October, 1917:

The present position of vaccine therapy	Professor Boyd.
Immunity	H. H. Mitchell.

Le Bulletin Medical, December, 1917:

De l'électricité en therapeutique	J. P. Fermont.
La radiothérapie du cancer de la peau	G. Ahern.

Medical Societies

ELGIN COUNTY MEDICAL ASSOCIATION

The annual meeting of the Elgin County Medical Association took place at St. Thomas, Ontario, on January 8th, under the presidency of Dr. G. A. Shannon. The reports of the various committees were submitted and the following officers elected for the current year: president, Dr. F. F. McEwen of Aylmer; first vice-president, Dr. D. Smith of Fingal; second vice-president, Dr. R. M. Lipsey of St. Thomas; third vice-president, Dr. D. J. Galbraith of Dutton; secretary-treasurer, Dr. W. F. Cornett of St. Thomas; executive committee, Dr. F. W. Smith of St. Thomas, Dr. A. Turner of Lawence, and Dr. G. McFarlane of Wallacetown.

It is the intention to hold a special meeting of the Association some time during the summer.

HALIFAX MEDICAL SOCIETY

The society held its opening meeting on October 24th, 1917, at the Victoria General Hospital, Professor John Cameron in the chair. The meeting was entirely clinical. Dr. J. G. Macdougall showed a number of cases successfully operated on for various conditions of throat and thyroid disease. Professor A. G. Nicholls discussed the effects of partial thyroidectomy.

The second meeting was held on November 21st at the University, when Captain V. L. Miller, A.M.C., read a paper on "Treatment and sequelæ of gunshot injuries of bones".

The subjects were dealt with in a lucid and incisive manner; and the discussion which followed was full of interest.

THE KINGSTON AND FRONTENAC MEDICAL SOCIETY

The regular monthly meeting was held in Queen's Military Hospital on December 10th, with vice-president Dr. Gibson in the chair.

Dr. H. A. Boyce showed a large number of rœntgenograms of gunshot and shrapnel wounds. The series included injuries, in one form or the other, of almost every bone in the body.

A second series showed calculi—renal and ureteral; a third various stomach and duodenal conditions. A peculiar distortion of the duodenum had been diagnosed adhesions and this was verified at operation; the duodenum was adherent to a distended gall-bladder containing many calculi. The stomach plates showed varying degrees of "low stomach". It developed during the discussion that there is perhaps no standard normal rœntgenologic stomach—that the shape of the stomach, and to some extent even its position, varies as the body-form of the individual; that many of these low stomachs occur in patients with a distinct enteroptotic habitus—poor musculature with a long, narrow trunk.

Dr. W. T. Connell presented the following case:

Private T., wounded at Vimy on April 30th, 1917, by shrapnel. A bullet entered the right occipital region just outside the midline and just above the superior occipital ridge. There was a comminuted fracture of the occipital bone, the right parietal and the frontal. The skull was trephined in the right parieto-occipital region, and a large piece of shrapnel removed. Hernia cerebri followed, but the wound healed in about three weeks, not, however, without considerable loss of brain tissue. Under the trephine opening there is now a large depression measuring two and one-half inches from behind forward, two inches from above down, and two and one-quarter inches in depth. The wound is healed. The wound in the right occipital region is filled in with bone. The depression over the right parieto-occipital lies two inches in front of the superior occipital line, and its upper border extends to within three quarters of an inch of the mid-line. This depression would cover most of the area of the supra-marginal and angular gyri and a portion of the post-central gyrus. The man shows partial loss of power on the left side, but no actual paralysis. He has lost completely coördination of this side, the movements being governed entirely by the sense of sight. He finds it quite impossible to move about in the dark. Epicritic sensation is lost over the entire left side and protopathic much diminished. His muscle sense is markedly blunted. He has an homonymous hemianopsia. Both pupils react sluggishly. Reflexes on left side are diminished, the patellar being practically lost. The man has no visual aphasia, no agaphia, no word-blindness. He is right-handed.

Dr. Connell also gave a preliminary report on the functional nephritic tests as carried out on returned soldiers with trench nephritis. These tests showed that practically all such cases, who have not had any previous kidney disease, responded similarly to

normal individuals, even though small amounts of albumin and occasional casts are still present.

Dr. Day reported, subsequently, that his case of congenital obliteration of gall-bladder and common duct had died of peritonitis at the age of eleven months and nineteen days. So far as he was able to learn from the literature his patient had lived about two months longer than any previously reported case.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

THE first regular meeting for the session 1917-18 was held Friday October 5th, 1917, and took the form of a smoker. The retiring president's address was read and the new officers installed.

THE second regular meeting of the society was held Friday, October 19th, 1917, Dr. A. E. Garrow, president, in the chair.

CASE REPORT: Development of hæmorrhagic disease following injury to the liver, by Dr. E. M. von Eberts. (The report of this case appears on page 139 of this number of the JOURNAL.)

Dr. W. J. Scott exhibited the specimens from this case.

DISCUSSION: Dr. C. K. P. Henry: I had the opportunity of performing the three transfusions in this case. The first was undertaken during the absence of Dr. von Eberts and when the patient was considered to be suffering from a bleeding duodenal ulcer; the transfusion was limited to 275 c.c. of blood. Preliminary tests were carried out and the patient and donor were found to be in Group 2. No reaction occurred after this transfusion. Hæmorrhage again recurred on September 29th. The pulse was 140–156 and transfusion was performed, 400 c.c. being taken from the brother-in-law, who was also in Group 2. After this second transfusion there developed what was to me a new symptom in transfusion work, a very prompt anaphylaxis, with œdema of the eyelids, lips, etc., even before the second tubeful was introduced into the patient. It was found that this reaction was due to the fact that she had had an injection of horse serum previously. We gave her adrenalin and there was no further increase in the amount of the œdema. The blood count improved following this second transfusion, the colour was better, the pulse was 120, the temperture less, and she felt and looked better. The following day the

œdema of the eyelids had almost disappeared. The third transfusion was done on October 4th, about the same quantity, and in this case I had a little trouble with one Kimpton tube and had to decant it into the one that had been used. In one of these transfusions I had twice filled the same tube without any sign of clotting. In the literature are noted several cases of anaphylaxis, in two when horse serum had been given intravenously before the transfusion.

Dr. W. F. Hamilton: I would like to know if any skin eruptions developed in this case; did the bruises show any increase of discolouration, or did any purpuric spots appear?

Dr. E. W. Archibald: I gather at one point of Dr. von Eberts' paper that in the history it was stated that the patient had had tarry stools before this injury. Is it possible she had a hæmorrhagic diathesis before the injury occurred and could that not be why the bleeding persisted from the liver until her death?

Dr. A. E. Garrow: With this large rent in the intrahepatic duct was there much evidence of bile in the peritoneal cavity?

Dr. F. R. England: As a practical surgeon I should say that this person seemed to have received very severe injury and in the absence of explanations given us so lucidly one might conclude that the severity of her injury together with her pregnant condition might easily account for her death.

Dr. E. M. von Eberts: Replying to the various questions:

1. The areas of ecchymosis, noted on the day of injury, showed no increase. At autopsy, performed two and a half hours after death, there was pronounced post mortem lividity, showing that the blood was in a very fluid state.

2. An indefinite history of tarry stools was obtained from the patient's mother, but was very unreliable. The patient had never vomited blood. Excessive bleeding had not occurred following dental extractions, nor had excessive bleeding been noticed following cuts or scratches. There was no family history of hæmorrhagic diathesis. Finally, at autopsy the intestinal tract was free from any evidence of chronic or recent lesions of any description.

3. The only fluid found in the peritoneal cavity at the time of operation was thin liquid blood. The area of laceration was walled off by adhesions between the liver and the diaphragm and the abdominal parietes. There was no evidence of injury to the diaphragm.

4. It is contrary to one's experience to meet with repeated

secondary hæmorrhages from a liver lacerated by injury or wounded accidentally at operation. In the absence of hæmorrhagic tendency the normal phenomenon of coagulation is noted. As death occurred six weeks after the original injury, it is inpossible to attribute death to the laceration *per se*, as, under other conditions, such a laceration would have undergone complete repair. It has been already stated that at autopsy careful search failed to reveal in the area of laceration any divided blood vessels of large calibre.

Paper: The paper of the evening was an address by Professor Arthur Willey, head of the Zoological Department of McGill University, who took as his theme, "The Foundation of Behaviour." Specimens of lizard and snake were exhibited.

The third regular meeting of the society was held Friday, November 2nd, 1917, Dr. A. E. Garrow, president in the chair.

Case Report: Intestinal hæmorrhage in the new-born, with recovery. Two cases were reported by Dr. D. N. Richards, which will be published in a later issue.

Living Case: Intestinal hæmorrhage in the new-born, by Dr. D. J. Evans.

The case which I bring before you is similar to that reported by Dr. Richards. The mother was a primipara, aged twenty-eight, admitted to hospital on October 15th with the membranes ruptured artificially an hour or two before coming in. There had been some labour pains for a short time but they had disappeared and did not begin until two days later. Pains began in the afternoon and lasted all night; at 7 p.m. meconium was seen in the discharge but the fœtal heart remained good. During the night the patient rested under morphia and hyoscine and in the morning the pains recurred, becoming stronger in the afternoon. There was delay in the perineum so that the child had to be lifted out by a low forceps operation. It was somewhat asphyxiated and had to be resuscitated. The amniotic fluid was yellowish-green and had a slightly foul odour. The infant was a female weighing 3,160 grammes and was 51 cm. long. There was a general icteroid tinge of the skin at birth. The mother's history showed temperature throughout perfectly normal, although there was a foul odour from the lochia. The history of the child was uninteresting for the first few days; it nursed well, but on the sixth day there was a vaginal

discharge of blood and mucus. On the seventh day a foul odour to the dark greenish bowel movements was noted and on the eighth day the motion was black with a very foul odour. At 3 p.m. that day another black stool was passed, large, and containing a quantity of blood. This was associated with evident collapse of the child, and 5 c.c. of the mother's blood was now injected into the buttock. Next day the stool again contained blood and the child's condition was very poor. In the afternoon a second dose of 10 c.c. was given into the buttock and from that time improvement continued so that on the twelfth day, three days after the second injection, the motions were yellow and the child was allowed to nurse. There was no fever, the highest temperature was 99·8°. On the thirteenth day the cord detached without hæmorrhage and the child's general condition showed rapid improvement. It is now fourteen days old and I present it to-night to show how little, if any, evidence there is of its critical struggle for existence a few days ago.

Many different forms of treatment have been used in these cases but mostly unsuccessful. Direct transfusion has been extraordinary in its success, even in cases of very extensive hæmorrhage. As a rule excellent results are obtained from injection of the mother's blood by preference, but any adult human blood is equally efficacious if injected muscularly. Another point that has been brought out is the use of blood serum, and for this purpose horse serum has been used successfully by a considerable number of people. Dr. C. J. Covernton, of Vancouver, had a very successful result from the use of diphtheria antitoxin, used simply for the serum; he had two cases which made a rapid recovery.

Discussion: Dr. Grant Stewart: I saw the case reported and it is doing very well and I think Dr. Richards is to be congratulated on the way he handled these cases. Last spring I had another case with hæmorrhage of the umbilical cord which I treated with calcium lactate. The child was a Hebrew and circumcision was delayed for a short time, but no trouble resulted at the operation when performed later. These hæmorrhages usually occur before the twelfth day, evidently some change takes place after that for they do not recur, as in my case where circumcision was performed later and no trouble resulted.

Dr. Brown: I would like to know if in these cases there was any lesion from the cord after it was first tied, suggesting absorption of the absolute alcohol as a possible cause of inducing the lack of coagulability of the blood.

Dr. G. A. Berwick: Recovery in these cases of hæmorrhage is not at all frequent. In a recent case where the hæmorrhage came on two or three days after birth I used blood serum from the father; it checked the hæmorrhage but the child did not recover.

Dr. D. F. Gurd: I might mention two cases of hæmorrhage in the new-born that took place almost immediately after birth. The first was a very large hæmorrhage, a forceps case; there was bleeding from the umbilicus and from the little wound at the side of the face. It had an enormous hæmatoma from which it died. Another in the same family, with two healthy children between, bled almost immediately after birth. There was no surgical interference, the bleeding was from the cord and from the bowel, and it died in two days. When the first child died I went into the history carefully and found a strong hæmophylic family dyscrasia on the father's side two generations back.

A few years ago a series of these cases was reported by a lady doctor, from Toronto I think; she treated them all with gelatin by mouth and they recovered.

Dr. Richards: About the alcohol, our technique for dressing cords is to pour a little 95 per cent. alcohol on a swab and squeeze it dry before applying to the cord. In these two cases there was no tendency to bleeding from the cord and as we use the alcohol as a routine in all our cases any untoward results would have been noted.

Case Report: Anthrax of face, by Dr. C. K. P. Henry. The report of this case appears on page 142 of this number of the Journal.

Discussion: Dr. Lauterman: This case interests me very much as I was one of the first to see the patient. He had been attended by another medical man who had to leave town and he came in to see me saying that he had had a bottle containing lead lotion and asking for a prescription to get more. The lesion looked to me to be the most innocent looking boil I ever saw and he complained of nothing whatever. On the second or third day after I had seen him his wife telephoned and asked me to see him as he seemed ill. I could not go at the time but sent a colleague who immediately sent him into hospital. I saw him within twenty-four hours after the onset of his illness and he then had no temperature nor malaise and the pain was trifling. The ultimate ending of course was very disappointing and I confess that the possibility

of anthrax never occurred to me. I have seen several cases in Europe but never one in Montreal.

Dr. W. S. Morrow reported a case he had seen in Germany eighteen years ago where the focus of infection was under the right eyelid. The man's occupation was that of handling hides.

Dr. A. E. Garrow: I would like to ask if there was any possible explanation of the source of infection in this particular case.

Dr. C. K. P. Henry: The man worked in an ammunition plant and Dr. H. R. D. Gray personally inspected every man there, and found nothing on any of the men to suggest a similar lesion. The only other source then was the horse which the man himself kept and which had a small sore which he had been attending, but the city inspector whom we called in to see the horse found nothing whatever in various cultures and tests and the animal was perfectly well a couple of days after the man's death.

Pathological Specimens: Series by Dr. H. Oertel.

1. This is a specimen of an appendix removed by Dr. Garrow. It is very typical. The appendix is tremendously enlarged, sausage-shaped, and filled with mucoid gelatinous material. Its general form is well preserved, the mucous membrane stretched, partly thinned and partly irregularly thickened, and its opening near the insertion into the cæcum extremely narrow, practically obliterated. These extreme cases are not very frequent, and when they do arise they are apt to give diagnostic difficulties. There are two theories as to their origin, one is that it is an essentially inflammatory condition and the other is that it is a developmental anomaly. Of these the inflammatory origin is more generally believed.

2. This second specimen is also typical; a syphilitic aortitis from a patient in the care of Dr. Hamilton, who died with anginal attacks. Although there was no Wassermann reaction in the blood, the lesion is anatomically quite typical. The origin of the aorta is characteristically scarred, puckered, and retracted. The left coronary artery is practically entirely obliterated, the opening extremely narrow as a result of surrounding cicatricial contraction. The origin of the right coronary artery is also somewhat narrow but the artery itself is fairly well preserved.

3. Cancer of the prostate with metastases in bones and dura mater of brain. This patient was a man of fifty who had been ill with an obscure chronic disease, clinically extremely difficult to diagnose. He complained first of severe intercostal pains and

pains in the neck, to this was later added a paretic condition of his legs. Ultimately ill defined mental symptoms appeared. The diagnosis was a probable cord tumour. At autopsy the dura mater of the brain displayed what appeared to be at the time, a well marked pachymeningitis hæmorrhagica chronica dextra. Further examination disclosed a disseminated and uniform nodular soft tumour growth of all the ribs of the thorax, also of the clavicle and of several vertebræ. On account of their uniformity and the general dissemination I was inclined to regard the growth at autopsy as multiple myelomata. However, due to the diligence of Dr. Gross, who performed the autopsy, we were able to go further. If one looks at this prostate one is not inclined to regard it as diseased, it is not enlarged or nodular, and during life also nothing had attracted attention to it. But if one examines it carefully, in gross sections small yellowish patches will be seen, which, as soon as we saw them, raised the question of cancer of the prostate with bone metastases. This was borne out by microscopical examination and it is remarkable to see how advanced the growth is in this prostate, which, but for close examination, would have escaped notice. Very interesting also is the fact that metastases in the dura mater were found in the areas which were the seat of pachymeningitis hæmorrhagica. Metastases from cancer of the prostate in the bone is generally recognized, but metastases in the meninges is rare.

The case was illustrated by microsopic slides from the organs.

Paper: The paper of the evening was read by Dr. E. W. Archibald on "The surgical treatment of intestinal tuberculosis".

It was discussed by Dr. A. E. Garrow and Dr. A. H. MacCordick, and Dr. Archibald replied.

Medical Societies

CANADIAN MEDICAL ASSOCIATION:—President—Dr. A. D. Blackader, Montreal. President-elect—Dr. H. B. Small, Ottawa. Acting Secretary treasurer—Dr. J. W. Scane, 836 University Street, Montreal.

ACADEMY OF MEDICINE, TORONTO:—President—Dr. D. J. Gibb Wishart. Secretary—Dr. J. H. Elliot, 11 Spadina Road. Treasurer—Dr. J. H. McConnell.

ALBERTA MEDICAL ASSOCIATION:—President—Dr. D. G. Revell, University of Alberta, Edmonton South. Secretary-treasurer—Dr. T. H. Whitelaw, Medical Officer of Health, Edmonton.

Annual Meeting, Edmonton, 1918.

ASSOCIATION OF MEDICAL OFFICERS OF THE MILITIA:—President—Lt.-Colonel A. T. Shillington, A.M.C., Ottawa. Secretary—Captain T. H. Leggett, A.M.C., Ottawa.

ASSOCIATION OF MEDICAL OFFICERS OF NOVA SCOTIA—President—Dr. George E. DeWitt, Wolfville. Secretary—Dr. W. W. Hattie, Halifax.

BRANT COUNTY MEDICAL SOCIETY:—President—Dr. E. R. Secord, Brantford. Secretary—Dr. M. N. Faris.

BRITISH COLUMBIA MEDICAL ASSOCIATION:—President—Dr. J. Glen Campbell, Vancouver. Secretary—Dr. H. W. Riggs, Vancouver.

CALGARY MEDICAL ASSOCIATION—President—Dr. H. A. Gibson. Secretary—Dr. J. W. Richardson. Treasurer—Dr. J. V. Follett.

CANADIAN ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS:—President—Dr. J. A. Machado, Ottawa. Secretary—Dr. George D. Porter, Ottawa.

CANADIAN HOSPITAL ASSOCIATION:—President—Dr. H. A. Boyce, Belleville. Secretary—Dr. J. M. E. Brown, Toronto.

CANADIAN PUBLIC HEALTH ASSOCIATION:—President—Dr. J. W. Hattie, Halifax, Nova Scotia. Secretary—Dr. J. G. Fitzgerald, University of Toronto.

Annual Meeting, Hamilton, May, 1918.

CENTRAL SOUTHERN ALBERTA MEDICAL SOCIETY:—President—Dr. J. S. Murray, Okotoks. Secretary-treasurer—Dr. G. E. Learmonth, High River.

COLCHESTER-HANTS MEDICAL SOCIETY:—President—Dr. J. W. T. Patton, Truro. Secretary—Dr. H. V. Kent, Truro.

DUFFERIN MEDICAL SOCIETY:—President—Dr. Rooney, Orangeville. Secretary—Dr. Smith, Shelburne.

EDMONTON ACADEMY OF MEDICINE:—President—Dr. C. U. Holmes. Secretary-treasurer—Dr. E. L. Garner. Library, 12 Credit Foncier Building.

ELGIN COUNTY MEDICAL ASSOCIATION:—President—Dr. F. F. McEwen, Aylmer. Secretary-treasurer—Dr. W. F. Cornett, St. Thomas.

FRASER VALLEY MEDICAL SOCIETY:—President—Dr. DeWolfe Smith. Secretary—Dr. D. F. Carswell.

HALDIMAND COUNTY MEDICAL ASSOCIATION:—President—Dr. Hopkins, Dunnville. Secretary—Dr. Courley, Cayuga, Ont.

Medical Societies—*Continued*

HALIFAX MEDICAL SOCIETY:—President—Dr. John Cameron. Secretary-treasurer—Dr. Hugh Schwartz.

HAMILTON MEDICAL SOCIETY:—President—Dr. R. Y. Parry. Corresponding Secretary—Dr. Fred Harper. Treasurer—Dr. T. W. Blanchard.

HURON MEDICAL ASSOCIATION:—President—Dr. Machell. Secretary—Dr. Hunter, Goderich, Ont.

KINGSTON AND FRONTENAC MEDICAL SOCIETY:—President—Dr. G. W. Mylks. Secretary—Dr. W. T. Connell, Kingston.

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The Canadian
Medical Association Journal

Vol. VIII. MARCH, 1918 No. 3

THE DANGER OF THE EXTERNAL USE OF WOOD ALCOHOL

By Robert E. McKechnie, M.D.

Vancouver

THE address of my paper, as seen in the programme, namely, "The use of wood alcohol in surgical cases," is rather misleading, as I do not advocate the use of this dangerous poison at all. Its object, rather, is to add a little to our present knowledge regarding the routes of entrance into the system of this agent, and to furnish a case in which the drug was taken in through an external surface.

The history of wood alcohol is of comparatively recent date. It is one of the products of destructive distillation of wood, hence the name. It was discovered as methyl alcohol in 1812, and has been extensively used in the arts ever since. Owing to its vile taste and odour it was not taken internally, until of recent years, when manufacturers succeeded in eliminating these objectionable features so successfully that it can hardly be distinguished from ethyl or grain alcohol.

The first case of poisoning was reported in 1890, and up to 1894 only three cases had been recorded. But in 1905 Buller and Wood reported a collection of three hundred and fourteen cases of poisoning by wood alcohol, one hundred and fifty-six of which were fatal, and one hundred and fifty-eight with partial or total blindness. Since then many cases have been recorded.

Nearly all these cases of poisoning have occurred in America. In England methylated spirits, formed by adding one part of methyl alcohol to eight of grain alcohol, has successfully competed with the refined American wood alcohol, owing to the reduction

Read at the forty-eighth annual meeting of the Canadian Medical Association, Montreal, June 15th, 1917.

of excise charges on the grain alcohol so used. And as this mixture retains the vile odour and taste of the methyl alcohol, cases of poisoning by the latter are almost unknown. Similarly, on the continent, owing to the cheapness of grain alcohol, used for industrial purposes, cases of poisoning have been very rare, and when they have occurred have been traced to the use of the American product.

The legitimate use of wood alcohol is as a solvent, etc. in the arts, but in America, owing to its cheapness and its refinement, unscrupulous manufacturers have used it in preparing various flavouring extracts, Jamaica ginger, etc., and it has been principally through the use of such preparations that poisoning has occurred.

There are three routes by which wood alcohol can gain entrance to the system, namely, through the alimentary tract, through the respiratory tract, and through the external surfaces.

The first is self evident.

As for the second method, numerous cases have been reported of "poisoning by inhalation". The varnishing of closets or small rooms with closed doors and windows, or of beer vats, or the evaporation or burning of wood alcohol in a confined space, have been responsible for a number of cases of blindness and also a number of cases of death.

As regards the third method I have not been able to find in literature an authentic case, although under this heading Wood quotes one case where a patient had been having wood alcohol rubs, but in addition had taken a dram of the liquid to drink.

This seems a small quantity to have any effect, but people show a decided idiosyncrasy for this agent, some reacting to very small quantities, while others seem immune. In addition, it is very commonly used for alcohol rubs without ill effects apparently, so that I am inclined to think the patient quoted by Wood was poisoned by drinking the small quantity rather than by absorption. Thomas Koller states that even half a dram has been known to poison when taken internally.

The symptoms of wood alcohol poisoning are similar whether ingested, or inhaled. A moderate case will have dizziness, nausea, vomiting and gastro-enteritis, with dimness of vision, often increasing to total blindness. A severe case is accompanied by more or less overwhelming prostration, according to the quantity taken. There will be the usual symptoms of alcoholic intoxication, vertigo, gastric distress, etc., and disturbance of vision.

"The more pronounced cases exhibit headache, muscular

weakness, vomiting, dimness of vision, often progressing to complete blindness, with considerable gastro-intestinal disturbance and evidence of depression of the heart's action."

"A step further and, with the exaggeration of all these symptoms, the patient becomes suddenly blind, or nearly so, with widely dilated reactionless pupils, slow respiration, weak pulse, sweating, delirium or unconsciousness, often passing into coma and terminating in death."

"The characteristic feature in nearly all the severe cases not terminating fatally, is bilateral, total blindness, coming on in a few hours, or perhaps not for several days; then a partial restoration of vision, which again in a few days or weeks gives place to more or less complete or permanent blindness, with atrophy of the optic nerve."

Some of Wood's quoted cases had blindness within forty-eight hours, in others progressing from dimness of vision to total blindness in four to five days, with early stupor, dilated pupils, and red face; some even had chills followed by fever.

The Eye. The organic lesion is an optic atrophy characterized by blurring of the outlines of the optic disc, slight swelling of the nerve head, and congestion of the central vessels of the retina. "Pathologically, two structures are affected in methyl alcohol poisoning—the ganglion cells and the blood vessels, the ophthalmoscopic picture varying according to the structures involved, and to the degree of the involvement.

In the first variety, the ganglion cells are primarily injured, and the injury leads subsequently to an ascending atrophy of the nerve fibres.

The second picture, pale nerve with narrow arteries, must be due to the effect of the poison on the blood vessels, and is comparable to poisoning by quinine and the salicylates.

The third picture, neuro-retinitis with swelling of the nerve heads and enlarged veins is either due to a real neuritis or dependent on altered circulation and pressure conditions within the cranial cavity.

In both these later forms, there is of course, the ganglion cell destruction added to the circulatory disturbance.

As a final result we find ophthalmoscopically a simple atrophy corresponding to the first class, and a neurotic atrophy corresponding to the second and third pictures.

It should not be forgotten that there is a marked cumulative

effect with this drug so that small quantities continuously taken can have dangerous results.

"It has been shown that when reasonable doses are administered to animals the participation of methyl alcohol in metabolism scarcely exceeds 3 per cent. of the total exchange of material in contrast with a more than tenfold participation of ethyl alcohol under comparable conditions.

"Furthermore the elimination of methyl alcohol from the body is distinctly delayed, so that the unconverted residue after a moderate dosage has been given, may fail to be eliminated completely even at the end of two days. Accordingly, if the defective destruction of this substance is considered in conjunction with the delayed rate of elimination, it becomes apparent that the repeated ingestion of considerable doses of methyl alcohol may lead to dangerous accumulations thereof in the body. This fact has heretofore not been duly appreciated."

I have gone somewhat into detail in describing the symptoms and effects of poisoning by wood alcohol, in order that you may have before you the main points, so that you can the more readily compare them with the symptoms of a case which happened in my own practice.

This case, I think you will agree with me, constitutes one in which markedly poisonous quantities were absorbed through an external surface, and affords the first definite case to be recorded of this class so far as my researches go.

My patient, a woman aged forty-five, had received a compound comminuted fracture of the leg, and there had resulted a sloughy non-granulating surface over the front of the leg, which I wished to clean up. This surface was about two by one and one-half inches in extent.

I ordered an alcohol compress to be applied, covered with oiled silk. Up to the date of this application the patient had been doing very well, but after two days' treatment by the compress, she became very drowsy, while after three days' treatment the symptoms were more pronounced. She was still very drowsy, was nauseated at times, and complained of blindness. Respirations were then twenty-eight and very shallow, pulse 88, temperature 97°, face flushed with dilated pupils, suggesting belladonna poisoning, but no thirst. Blindness was now absolute, so that a lighted electric light bulb held before the eyes could not be distinguished. It was recognized as a toxic case, and investigation showed that the alcohol used was Columbian spirits, which is a

refined wood alcohol. This was at once discontinued. But in spite of the discontinuance on the fourth day, the fifth was the most critical. The patient was in a very low condition, pulse 96 and irregular, temperature varying from 100·2° down to 96·6°, rising again to 100°, breathing hurried, and patient almost in a stupor. However, by the next day improvement all around began, and soon she was back to her condition previous to the use of the alcohol. All but the eyes, but here a slight improvement was noted on the seventh day, while on the ninth day Dr. Farish reported as follows on this condition:

Conjunctiva and cornea normal, pupils dilated. Iris sluggish, contracting to light. Lens normal, vitreous normal. Vision, movements of fingers only. Vessels of retina contracted, especially the arteries. The disc uniformly white and outlines fairly distinct. Retina a little blurred, and here and there, especially around the macular region are seen pin point white spots, foci of degeneration.

Diagnosis. Optic atrophy—low grade retinitis. This observation was made over a year ago.

Following this there was a very gradual improvement in sight for some months, until finally a resting stage was reached, at which the patient now is. She can distinguish the form of a person, if the light is good, but cannot tell who it is except by recognizing the footstep or the voice, even at three feet distance. She can feed herself, but not by sight, as she has to feel for the various dishes. And for the last few months has shown absolutely no improvement. But fortunately, so far, the usual relapse into deeper blindness has not been reached, and I trust will not take place.

In this case we had an application of wood alcohol to a raw surface for four full days. The application was covered in with oiled silk, so that the heat of the leg would not cause its dissipation, but rather it would be held in a most favourable condition for absorption. The cumulative effect of the poison is also seen in that the early symptoms were not noted till the second day, and not until the fifth day, the day after the discontinuance of the dressing, was the maximum effect reached. As for the symptoms, they present a complete picture as already described in this paper, of wood alcohol poisoning, viz., marked prostration, more or less stupor, gastro-intestinal disturbance, weakened heart's action, respiratory disturbance; all indicating poisoning by some very toxic agent, and to complete the picture, rapidly

occurring blindness, with improvement to a very moderate degree in this latter symptom on the withdrawal of the exciting agent.

Lastly, Dr. Farish's report showing contraction of the vessels of the retina as well as the nervous lesion, corresponds well with the description of the changes in the eye previously narrated, so that I think I have absolutely proved my point that this was a case of wood alcohol poisoning by absorption through the external surface of the body. And when one comes to consider the comparatively small area through which the absorption took place, it emphasizes the danger of allowing so powerful a poison to be taken into the sick room.

That poisoning can occur by absorption through the intact skin is not yet proven. Crawford described a case in a woman of sixty, who after wood alcohol rubs for two weeks developed dimness of vision, 15–20 in right eye, nil in left, with a grey atrophy of the disc. This is not a usual effect, as both eyes usually suffer equally, but if this is a true case of wood alcohol poisoning by absorption through the skin (it might be by inhalation from repeated rubs on an extensive scale, and also a cumulative effect), but if it is a true case, then this drug should be banished entirely from personal use. We know that it is still extensively used for bath purposes. And it is also in some hospitals used daily by surgeons and nurses for disinfecting hands and arms after the preparatory scrubbing for an operation.

Perhaps this paper will lead to a careful study of its effects and perhaps cases of moderate impairment of vision may be traced to its continued external use. Personally, I am not taking any chances with it, for I have discontinued its use since encountering the present case.

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A BRIEF CONSIDERATION OF THE STATIC LABYRINTH AND EAR TESTS FOR AVIATORS

By Robert H. Craig, M.D., F.A.C.S.

MUCH has been written during the past century upon the subject of our position in space and our sense of equilibrium. While a large share of this literature is highly theoretical and based upon incomplete experiments, yet enough exact work has been done to enable us to draw certain accurate conclusions.

The atmospheric pressure at sea level is, as we all know, fifteen pounds to the square inch; as we ascend it diminishes; therefore in order not to jeopardize the lives of our aviators we must know whether their receptive centres are absolutely normal, so that they may retain their equilibrium at any altitude and in any position.

A man standing on the earth maintains his equilibrium not only by ear balance but by sight and muscular sense. Rising in the air and flying in a cloud or in the dark he must depend almost entirely upon his static labyrinth.

It has long been known that the semicircular canals of birds are very highly developed. Lee points out that birds and fish are best suited to experiments on the inner ear because they spend so much of their time in a fluid medium away from contact with a solid supporting surface. These animals have been therefore the favourite subjects for investigators.

To refer briefly to the historical side: Nearly a hundred years ago Purkinje made some interesting experiments with rotation and worked out certain laws accurately, but unfortunately he did not consider the static labyrinth in this connexion.

Flourens, however, in 1828, proved by experiments upon the labyrinth of pigeons that the semicircular canals were positively connected with movements of the head.

In 1870 Goltz showed that equilibration was the result of

Read at the fourth regular meeting of the Montreal Medico-Chirurgical Society, November 16th, 1917.

afferent impulses from peripheral end organs to a central mechanism with resulting efferent impulses to groups of muscles.

Ewald, of Strasburg, in 1892, was the first to prove the function of the semicircular canals. His work with pigeons included the careful introduction of a small pneumatic hammer which touched the membranous canal and was controlled by a bulb at the end of a rubber tubing. By plugging the opening farthest from the ampulla with metal, and compressing the bulb, he was able to cause the endolymph to flow towards the utricle or away from it. He observed that the eyes and head always moved in the direction of the endolymph flow and in the plane of the canal which was stimulated.

We learn therefore, from Ewald's experiment, that the greater physiological impulses are produced in the horizontal canal by the movement or impact of the endolymph from the smooth or nonampullated end of the canal toward the ampullæ and utricles. Whereas the stronger physiological impulses from the crista of the superior and posterior canals are produced by a flow of endolymph in the reverse direction, namely, from the utricles through the ampullæ to the smooth or nonampullated end of the canals. We now believe that each crista is a double end organ and that each emits nervous impulses antagonistic to the other half.

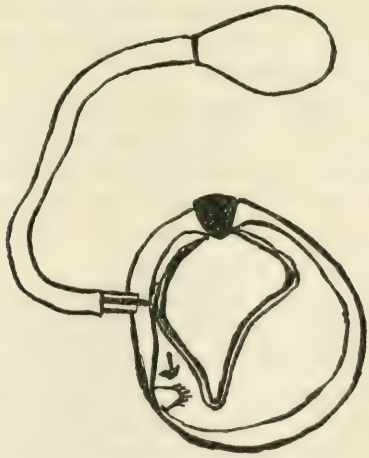

Diagram illustrating Ewald's experiment on pigeon with pneumatic hammer

Lee, of Columbia, experimented with sharks and found that if both anterior ampullæ were divided the fish dived downward; on

section of the nerve of both anterior ampullæ, the fish swam upward, sometimes putting its head out of water.

Kubo reached some complete and accurate conclusions resulting from experiments on the semicircular canals and vestibular sacs of fish in the zoological station in Trieste in 1905 and 1906.

His experiments on deviations of the eyes and the otoliths of the vestibular sacs are particularly interesting.

Kubo experimented first by holding the fish in various positions. He discovered that the eyes invariably turned in certain directions—for example, holding the fish head downward the eyes rotated upward.

He then exposed the membranous sacs to view and observed the gliding movements of the otoliths. He found that they glided in a direction corresponding to the movement of the eyes.

He next manipulated the otoliths with a small cotton-protected probe and was able to control the rolling of the eyes. Thus the artificial movements of the otoliths produced reflex deviation of the eyes exactly similar to those caused naturally by changes in the position of the head.

Experiments with partial or total extirpation of the otoliths proved that interference with the otoliths affected the reflexes on the same side.

Kubo after giving due credit to the many preceding experiments observes that: "Also with fish every body position corresponds to an exact eye position and when the otoliths are removed or the entire vestibular apparatus is destroyed this relationship is lost."

George Washington MacKenzie has written extensively upon this subject and his learned book and numerous original papers have helped materially to blaze the trail into this newly discovered domain.

Professor MacKenzie examined a large number of selected cases of deaf mutes and concluded that the function of the semicircular canals has to do with the perception of turning movements while the function of the utriculus and sacculus are both static and dynamic. Static—for the perception of position in space, and dynamic for the perception of straight lines, so long as the movement is increasing or diminishing in velocity.

All the experiments of these physiologists and many others have confirmed Flouren's early observation that the vestibular apparatus is a special sense organ and is solely concerned with orientation and equilibration. The physiological connexion of

the vestibular apparatus with the sense of sight, the kinesthetic sense (muscle joint sense) and the tactile sense cannot be too strongly emphasized. Duel goes so far as to say that these connexions are far more intimate than its relationship with the auditory nerve (but I cannot quite agree on this point). As the closeness of these relationships has not been generally appreciated, I should like to call special attention to it. Duel states that the eighth nerve should be described in anatomy and physiology as the nerve of hearing only, with its end organ, the cochlea. The vestibular branch should be given its own place. It is the nerve of orientation and equilibrium with its end organ the vestibule and semicircular canals. It is the perfected development of the primitive stiffened tentacle of the jelly fish, the calcareous particles (otoliths) of the higher forms up to the more elaborate vestibular apparatus of the vertebrate.

In the perfectly normal individual the conception of position is the result of the harmonious assembling of all the afferent impulses. The sense of our position in space (orientation) and our adjustment to it or balance (equilibration), are more essential than any other sense. Without sight, hearing, or smell we can get along, but with impaired sense of position or balance, life is not worth living.

The jelly fish deprived of his stiffened tentacle falls inert to the bottom. A dog without his vestibular apparatus is at first helpless but assisted by intelligence and his other senses, he learns to walk, eat, and run. If, however, he jumps from a small height he falls in a heap, or if thrown in the water he sinks immediately. Without a sense of balance in an unusual environment he is lost.

When a man is deprived of his labyrinth by sickness the opposite labyrinth and the other senses come to the rescue and usually there is time for adjustment. If the deprivation of one vestibular apparatus is sudden he is temporarily very much upset. He has violent vertigo, and also illusions of motion in which his eyes follow an object until it apparently moves out of sight, and then snap back and repeat these oscillations or nystagmus. His motions are, of course, extremely uncertain. These symptoms, however, subside in a few days and in a few weeks the ordinary acts are easily performed. So a man losing one eye sees everything first flat, and when he gazes attentively at an object it becomes blurred. A man becoming deaf in one ear cannot locate the direction of sound until he learns to move his head slightly to get two different angles.

We all know the illusion of watching another train moving while ours stands still. Our sense of orientation easily corrects this by closing our eyes for a moment, or looking at an upright object in our own car.

It would be quite possible for an aviator who had no static labyrinth to guide an aeroplane with ease while the earth below was visible, but let him fly into a cloud—without his sense of equilibration and orientation he would in all probability become utterly confused. We do not realize how much we depend upon this sense.

Jones, of Philadelphia, in a recent paper on the subject states that experienced aviators are invariably found to possess a normal vestibular apparatus and are enthusiastic about the Barany tests. One man who has flown for fifteen years says he remembers three fatal falls which could be attributed to no apparent causes but were probably due to faulty ear balance.

A doctor who had been giving the tests underwent them himself and was dismayed to find that he had complete lack of ear balance after trying the caloric and turning tests, past-pointing and falling. The trouble was directly traceable to ear complications of mumps in childhood. The only previous suggestion was that he had never been sea-sick. He was made to realize that without the Barany tests he would not have known of this lack and might have paid for it with his life.

The standardization of these tests is a matter of great importance in order that a prospective aviator may not find the tests in one place easier than in another. In the United States a number of otologists have been given an intensive training in this work by expert military specialists. They have now formed thirty centres in various parts of the country where the work is done in precisely the same way. Decisions of these trained specialists are final.

Let us now consider briefly Barany's findings.

In the normal individual in response to certain physiological stimuli or tests we invariably see reflex movements of the eyes, or nystagmus; and of the body and limbs, or reaction movements.

Increase or diminution of these reflexes in response to stimuli indicate an increased or diminished irritability of the semicircular canals.

Hunt in discussing Duel's masterly paper on this subject says: "A proper understanding of their detail and technique is essential for the interpretation of the various disturbances of

labyrinthine tonus, for the differentiation of vestibular affections of central and peripheral origin, and in cerebellar localization. The labyrinthine tonus is a homolateral mechanism in its influence, namely, the right labyrinth and right cerebellum control the corresponding half of the body. As a result of these observations Barany reached the important conclusions that in the cerebellar cortex, the various segments (joints and muscles) of the extremities are represented by four centres which are concerned with the direction movements, namely, horizontal (right and left) and vertical (up and down). A stimulation of the labyrinth on one side induced a corresponding alteration of tonic innervation in the direction of the movement.

Barany has elaborated with great detail and exactness a number of tests for the determination of this tonus mechanism of the labyrinth and its influence on the movements of the extremities and trunk.

It is important to recognize that vertigo and ataxia are due to disturbances of the vestibular mechanism, peripheral, central or psychic, and that clinically we should always think of vertigo in this concrete neurological sense.''

There are four different tests as worked out by Barany.

1. By irrigation of the ear with hot and cold water—the caloric test.

2. By means of the galvanic current—the galvanic test.

3. By compression or aspiration of the auditory canal—the fistula test.

4. By rotation—the rotary test.

The caloric test consists in syringing the ear with hot and cold water. In the normal person water introduced at body heat produces no reaction. When cold water is introduced there follows a rotary nystagmus in which the quick movement of the eyes is away from the ear irrigated. The patient experiences subjective vertigo and exhibits marked disturbance of equilibrium.

When hot water is introduced we see exactly the same phenomenon except that the direction of the nystagmus is directly opposite or toward the ear irrigated. When cold water is introduced if the head is bent forward and downward at an angle of 90°, the conditions are reversed and the nystagmus is toward the ear under treatment. With warm water, also, when the head is bent forward, conditions are opposite and the nystagmus is away from the irrigated ear.

These reactions are nearly invariable with normal persons. When the vestibular apparatus has been destroyed the nerve can no longer respond to heat and cold and the caloric reactions are absent.

Barany ascribes the reaction to endolymph movement produced by difference in the specific gravity of the cold and warm portions of the endolymph. Time will not allow a more detailed explanation of this test.

The galvanic test, while it also enables one to test each labyrinth separately, may excite reactions by stimulating the vestibular nerve trunk and is therefore not as reliable as the caloric or rotary tests. "Reports of galvanic irritation both in health and disease have been so contradictory as to leave its diagnostic value in considerable doubt."

The fistula test is seldom used except in certain special selected cases as it may possibly set up inflammation and has no diagnostic value unless it is positive. The application of the fistula test, if a circumscribed labyrinthitis is present, may result in diffuse inflammation and meningitis. The pneumatic pressure necessary to bring about the reaction does not fit all cases and is now considered by many authorities to be too dangerous for routine practice.

The rotary test is best indicated for testing an apparently normal subject. It is rather a violent procedure for a patient suffering from acute labyrinthine disease. It has been generally adopted by the army officials as the best possible test for aviators and is now used entirely, having superseded the caloric test, as the quickest, surest and easiest of application in determining the entire function of the vestibular apparatus.

In rotation when the head is held in the erect position and suddenly turned in the horizontal position the endolymph at first lags behind in the two horizontal canals by reason of its inertia, that is, it is displaced in the opposite direction. If for example in the head is turned to the right the initial endolymph movement in the right horizontal canal will be toward its ampulla—while in the left horizontal it will be toward the small end of the canal.

Now, according to Ewald's experiments, these are precisely the endolymph movements which in these canals should produce nystagmus to the right, and this phenomenon is always present during rotations to the right. When the rotations are suddenly stopped, the endolymph this time by reason of its momentum, is displaced in the opposite direction with the result that the direction

of the nystagmus is reversed, that is, it is now to the left. During rotation we may by changing the position of the head bring different canals under the influence of the experiment, and thus vary at will the form of the nystagmus. In all cases, however, the nystagmus follows a definite rule, namely, during rotation a person exhibits nystagmus in the direction in which he is turned. When the turning is stopped, nystagmus in the opposite direction immediately follows.

I can do no better than to give you the official United States aviation tests which are of paramount interest to us all.

The tests themselves are as follows:

Ear Determination

"Hearing should be normal for each ear. To determine this both the whisper and watch tests are used. After examining both external auditory canals and membrani tympani by means of a speculum and good light (first removing any wax if present) for abnormalities such as a small and tortuous opening, presence of pus, perforation scars, retraction, or other evidence of past or present inflammation, which are causes for rejection, the candidate is required to stand at twenty feet from the examiner and facing away from him. An assistant closes the ear not under examination with his moistened index finger, pressed firmly into the external auditory meatus. The examiner facing the back of the candidate exhales and then, with his residual air, whispers numbers, words, or sentences which the candidate should repeat. The other ear will then be tested in a similar manner. If unable to hear, the examiner will approach until the candidate does hear, the distance being recorded in feet. If less than twenty feet it is a cause for rejection. A quiet room is essential.

The watch test is preferably made with a loud ticking watch such as the ordinary Ingersoll which, while variable, should be heard at about forty inches. Any watch used should have been previously tried out on at least five normal persons and the distance heard made a matter of record. The number of inches in distance heard by the candidate, eyes closed and opposite ear occluded, is taken as the numerator and the distance the watch should be heard as the denominator. This should be the equivalent of 40–40; otherwise disqualifies.

Naso-Pharynx

This region should be carefully examined. If defects can be removed by operation, this should be required prior to completing the examination. If nonoperable or operation refused, it is a cause for rejection.

Static Tests

The erect position should be maintained for one minute without marked swaying. Eyes closed.

Equilibrium (Vestibular)

The observer first looks for a spontaneous nystagmus or twitching of the eyes looking straight ahead or in any direction.

Rotation nystagmus is determined by placing the candidate in a revolving arm chair of a standardized pattern with head and foot rest, the head is tilted backward and eyes closed. Revolve the patient towards his right ten times in exactly twenty seconds. The candidate is stopped suddenly, facing the examiner in a good light, and told to open his eyes and look straight ahead. The eyes will be seen to be oscillating; the quick component, which is the movement most easily seen, will be in the opposite direction to the turning, namely, to the left. The number of seconds duration will be noted. The test is then repeated, turning him to the left. Nystagmus will now be to the right. In each case it should last about twenty-six seconds. A variation of ten seconds either way is allowable. The nystagmus is the result of stimulation of the horizontal and anterior semicircular canal and is therefore rotary.

Past-Pointing

The patient sits in the chair, eyes tightly closed, and faces the examiner and touches the examiner's forefinger in front of him, raises the arm in the perpendicular position and attempts to find the examiner's finger, both right and left. Normally, the person will always find the finger. The patient is now turned ten times to the right for ten seconds, the chair is locked in position and the person to be examined told to touch the finger in the same manner, right, left, right, left, right, left (three times). Normally the finger will point to the right, the past-pointing will be less each time it is tried, and on the fourth turn the finger should be touched accurately.

The same experiment is then performed by turning to the left the patient always past-pointing in the direction of the turning. Finally the head is inclined 90 degrees downward and the patient turned to the right five times in ten seconds. On stopping, the patient raises the head, and he should then fall to the right. These test the vertical semicircular canals. He is then turned to the left in the same manner and falls to the left.

Braun and Friesner state: "All the centripetal impulses, whose purpose it is to maintain our equilibrium, are gathered together in the cerebellum, so that the latter may be considered, in a sense, the centre for the static labyrinth. There probably is no single, definite (static sense) centre upon which all of the centripetal impulses exert their influences. The cerebrum must play a very subordinate rôle in this static sense, however, for it has been entirely removed in dogs without causing any loss of equilibrium. On the other hand, removal of even half the cerebellum results in very decided loss of balance.

"The cerebellum may be considered as a sensory-motor subcortical central organ. It receives centripetal impulses from the static labyrinth, sensory impulses from the muscles and joints and visual impulses from the eyes, and it sends out motor impulses to the muscles of the head, trunk and extremities, the purpose of which is to maintain the equilibrium of the body.

"All of the motor impulses, however, which have for their purpose the maintenance of the body equilibrium, do not originate in the cerebellar cortex. The impulses which arouse these movements, however, pass through the cerebellar cortex on their way down to the spinal cord. In the cerebellar cortex they meet the centripetal impulses from the static labyrinths, the muscles, the joints and the eyes, and are there acted upon in such a way as to become effective in maintaining the equilibrium of the body."

We know that we keep our balance upon the earth's surface by the working out of certain immutable laws which after a hundred years of research we are beginning to observe with more understanding. It has occurred to me whether it may also be possible that this old earth of ours, suspended in space, is held in its orbit by the great changing waters responding to the laws of gravitation. They move in mighty masses as tides, as floods, as over-flows and by the turning of little creeks to mighty rivers when the snow melts. Can it be that these incomprehensible fluid changes occupy the same place on the earth's balance power that the endolymph fluid fills in the body of a man? We know

that there is three times more water than land, most of it constantly moving. Perhaps the continents and islands act as the otoliths do in our bodies and all respond to the electro-chemical changes brought about by the sun's rays. It seems to me reasonable to suppose that the same principles that govern the earth are maintained in the individual.

My lamented friend and professor who was always an inspiration of the highest professional ideals to me, the late Doctor T. Wesley Mills, was deepy interested in orientation and equilibration and did considerable original work on the semicircular canals of pigeons. It is to be regretted that he could not have lived to see the present day development of this work.

We are always hoping that at last we may come within range of an understanding of the vast harmony composed of all the vibrations governing not only the laws of music and sound to delight our ears, but controlling our every motion and even life itself, as well as those great things beside which we are but atoms. Small though we may be we have been given minds capable in some degree of comprehending this wonderful music of the spheres. When we have learned to attune ourselves and eliminate the discordant notes in our own lives, then life shall take on a new and more beautiful meaning, and wars, in the nature of things, will be no longer possible.

In all this work the ophthalmologist, internist, and neurologist are indispensable working companions with the ear specialist.

Together, in the interest of our profession, we may follow the path of Ulysses in which he describes himself as:

> "This grey spirit yearning in desire
> To follow knowledge like a sinking star
> Beyond the utmost bounds of human thought."

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A CLINICAL REPORT ON ONE HUNDRED AND THIRTY-ONE CASES TREATED BY ARTIFICIAL PNEUMOTHORAX

By W. B. Kendall, M.D., C.M.

and

C. C. Alexander, M.B.

Gravenhurst, Ontario

I HAD an opportunity of presenting a brief paper on the subject of artificial pneumothorax during the meeting of your association at St. John in July, 1914. At that time we had under consideration but twenty-one cases.

During the past three years we have increased this number to one hundred and thirty-one cases; and I wish now to consider the clinical findings so far presented.

The efficacy of this form of treatment depends mainly upon the degree of functional rest that can be established and maintained in the compressed lung, and the lessening of toxæmia by the discharge of the tuberculous foci. Each case, of course, must be viewed and treated on its own merits.

We have up to the present time attempted treatment in advanced cases, some moderate, others far advanced; in fact, we have but one incipient case among those under consideration; the compression in this case being established to control an apparently untreatable cough. We cannot help feeling pleased, although perhaps not satisfied, that the results obtained are so favourable, when we consider the class of case under consideration and the almost hopeless outlook presented under sanatorium treatment.

Our experience has been that the cases in an institution do better than those at home.

Reasons for Attempting Artificial Pneumothorax

(a) *Lessening the toxæmia,* and by so doing, the distressing symptoms caused thereby. We refer more particularly to fever, night sweats, expectoration, loss of weight and the control of cough.

Read before the Canadian Medical Association, Montreal, June 13th, 1917.

(b) *Splinting the lung;* and by this immobilization, impeding the means of spreading infection through the blood and lymph streams.

(c) *Control of hæmorrhage, when present.*

(d) *Psychological effect.*

Reasons for not Attempting Artificial Pneumothorax

(a) While we feel that the theory regarding artificial pneumothorax is sufficiently logical to warrant precise results; we have, up to the present time, felt it unwise to treat those who have every chance of doing well under ordinary measures of treatment; and we always keep in mind the question of remote complications which might occur. Chief among the latter, and in fact the only complication of great importance is the formation of pleural effusion. We would not advise artificial pneumothorax in chronic fibroid cases, unless hæmorrhagic; while we have considered a tuberculous involvement in the bowel and kidney, diabetes, a serious heart lesion or arterio-sclerosis as among the complicating factors which militate against the use of this measure.

Classification of Cases

Our experience has led us to consider artificial pneumothorax as being indicated in progressive and stationary cases, or in patients suffering from hæmorrhage, and we have classified our observations in accordance with results expected as:

(a) *Curative.*

(b) *Palliative, and as an ultimum refugium.*

Factors Considered Before Attemptiing Artificial Pneumothorax

(a) *Chest involvement.*

1. *Bilateral or unilateral.*

While promising results are more likely to be obtained in strictly unilateral cases, our statistics show that 71 per cent. of our cases had involvement on both sides of the chest. While it is essential that adequate compensation be established, still it is quite possible, in many cases, to obtain favourable results in bilateral cases. Although our findings will not support the supposition that the collapse of one lung produces a beneficial and curative result upon the disease in the other lung; still a lessening

of activity has been noted in some cases in the less diseased side of the chest.

2. *Side compressed.*

Compressions have been made on the right side in 42 per cent. and on the left in 58 per cent. of our cases. We have found no particular difference in the ultimate results although there may be more immediate effects on the heart action, respiration, and digestive system with left sided compressions.

3. *Age.*

We have not had an opportunity of treating children, while the age of treatable cases has not been in any way a factor worthy of consideration.

4. *Duration of disease.*

Most pronounced results have been obtained in the more progressive than in the chronic fibroid type.

5. *History of previous pleurisies.*

The question of a history of pleurisy has had no bearing upon the results of pleural space inflation; in some cases marked plueritic adhesions were met with where no history had been given and vice versa. Diaphragmatic adhesions are likely to give most trouble.

(b) *The use of x-ray.*

Fluoroscopic and radiographic examinations should be made in all cases. In 75 per cent. of our cases the *x*-ray was used; but in some cases we were able to find a partial or complete pleural space which the röntgen ray did not reveal. Pleuritic adhesions are never entirely absent in advanced tuberculous lung conditions, so that we feel that puncture attempts should be made in selected cases, no matter what the physical or röntgen examination findings may be.

(c) *General condition of patient, including symptoms before operation.*

In most advanced tuberculous cases a condition of general malaise is usually presented including a loss of weight and strength. With this we find cough and expectoration present, and the results of toxæmia such as fever, night sweats, secondary anæmia, etc.

Immediate and Ultimate Results Expected

After collapse, in so far as symptoms are concerned, we find that the cough and expectoration may be more troublesome; but this is followed by a marked decrease. Lessening of fever is usually noted within the first seventy-two hours and there is a

definite and continuous improvement in the patient's general condition. With the improvement of symptoms there is a marked change in the patient's mental attitude. Patients are always willing and anxious for further treatment. This is not only due to the relief of symptoms but also to a stimulating psychological effect.

Technique

(a) *Preparation of patient.*

The intercostal spaces are rendered wider by placing a small soft pillow under the axilla. The skin is thoroughly painted with tincture of iodine, and the skin and parietal pleura anæsthetized with a 1 per cent. solution of novocain. We used morphia in a few early cases but do not advise it. In two cases we resorted to the assistance of ethyl chloride.

(b) *Preparation of operator.*

The hands and arms after being thoroughly scrubbed are immersed in a solution of lysol. We have made 2,383 punctures, without an appearance of sepsis.

(c) *Instruments and their preparation.*

We used a 1 c.c. Record hypodermic syringe with a small bored short needle for anæsthetizing purposes. We have used and discarded the Saugman and many other needles especially made and advised for artificial pneumothorax, and use one made of platinum, two inches long, of medium bore, and with a blunt non-cutting point. This needle is used for initial attempts as well as for refills. Where the tissues are particularly resistant, a needle with a sharper point can be made use of. All needles are fitted with ordinary wire stilettos. A piece of small sized rubber tubing, fitted at one end with a glass tube, is used for connecting the needle with the larger rubber tubing of the pneumothorax apparatus. This small tube and all instruments used are boiled before use in each case, and kept in alcohol until used.

(d) *The location of puncture.*

We have found the post-axillary line preferable, although the exact location will depend on adhesions. The lower the puncture the better, in order that diaphragmatic adhesions which are the most difficult to deal with can be peeled off or loosened.

(e) *Mode of puncture.*

We have found it best to make a puncture in the skin and subcutaneous tissue just below the upper edge of the rib; having the needle rest upon the upper part of the latter, anæsthetizing the parietal pleura first and the skin last. We find that making a

puncture in this way a valve effect is produced, thus preventing to some extent the occurrence of surgical emphysema.

(f) *Gas.*

A small amount of oxygen is used in the first fill, 100 c.c. being sufficient, this followed with nitrogen or filtered air. The entire initial inflation is made with an amount not exceeding 500 c.c. In cold weather it is best to warm the gas by having a part of the rubber tube immersed in hot water.

(g) *Pressure.*

We resort to water pressure only, this pressure being somewhat different in the four machines we have in use, owing to the style of the machine and the size of the glass containers. We never use bulb produced pressure. The gas is never allowed to enter the chest until we are satisfied with our manometric readings, and until we have fitted the shank of the needle with a Record syringe and assured ourselves that the needle is in the pleural space, and not adjacent to it in the lung or in a blood vessel. The inflation should be made slowly and pressure not increased too rapidly.

Complications Which May Present Themselves.

(a) *While operating.*

The patient may complain of pain, this may be reflex, may be caused by the breaking down of adhesions or through pressure. If from the latter this fact will be readily noticed from the manometric readings. If the pain is severe or if convinced that adhesions are present and but a small pleural pocket is being filled, the operation should be discontinued. Gas embolism is possible but is not probable, if due precautions are taken to avoid it.

Pleural shock has been cited as a complication during the operation, but proper and thorough anæsthetization of the parietal pleura will prevent this. We have had to discontinue treatment in a few cases on account of pain, but we have had no occurrence of embolism or pleural shock.

(b) *After operating.*

Dyspnœa. The patient may be distressed through shortness of breath, although this is not frequent, and need not be, if the operator is careful in noting the readings on his manometer and thus determining the size of the pleural space, and the degree of mediastinal rigidity. Skin sepsis may occur, but if so carelessness is the cause.

Some patients have no desire for food after the first few com-

pressions, more especially left sided cases; although in the majority of cases no such condition is experienced if the amount of gas is not too great.

(c) *Surgical emphysema.*

Some few cases of superficial emphysema were observed as well as two cases with gas around the mediastinal tissues and higher up in the tissues of the neck.

(d) *Pleural effusions.*

We consider the formation of fluid to be the one serious complication that can occur during treatment by artificial pneumothorax.

Effusions have been formed in twenty per cent. of our cases. Most of these have occurred after six months' treatment, mostly in cases with marked cachexia and particularly those who have indulged in considerable activity.

Although many theories have been advanced, no definite cause has been assigned. Our impression is that the cause is mainly infection from within and has been more frequent in those of a cachectic type, with acute ulcerative processes or with an acute mixed infection present. Our experience has also led us to believe that patients indulging in sudden unaccustomed exercises are more prone to develop pleural effusions, and also that large inflations at high pressure have been determining factors.

In the majority of cases the fluid is apparently sterile at first but gradually becomes purulent and in most end cases the tubercle bacilli can be demonstrated.

The amount varies in individual cases. In four of the twenty-six cases in which fluid occurred, the amounts were small and did not recur after one oxygen refillment.

We have used oxygen refillments in some cases in an endeavour to assist fluid absorption.

Frequency of Refills.

The frequency of refills depends upon several factors and these briefly stated are:

(a) *Absorption.*

1. This will differ in each individual case while the reason is not explainable.

2. Activity of patient. The gas will be absorbed more rapidly in those patients who are active then in those who are on rest.

3. Atmospheric conditions. In cold weather the gas is absorbed more readily.

(b) *Amount of gas.*

1. This will depend on the variation of pressure and in accordance with the process of absorption.

2. Moderate amounts of gas are advised. We very seldom exceed 1,000 c.c. while the average amount is 500 c.c.

3. The amount of gas will vary in each individual case.

4. We never exceed 500 c.c. of gas (N and O combined) in first operation.

5. Frequent refills at short intervals are preferred to large refills at greater periods, as in this way more complete compression can be sustained.

6. Reference should be made to a skiagram, or the fluoroscope made use of in determining frequency and amount of refills.

7. No definite degree of absorption of nitrogen can be depended upon. This will vary with the case and the stage of treatment.

8. Treatment should be continued indefinitely or until convinced that complete fibrosis has developed.

Position of Mediastinum

Varying degrees of mediastinal mobility is noted in different cases, and this will be affected by adhesions. These adhesions may be diaphragmatic in character or established in the upper part of the pleura or around the mediastinal glands. While the manometric readings may be of some service as a guide, we have not found them to be of positive value as an indicator.

X-ray Plate and Skiagram Reading

Some means of measurement is required in order that we may get definite readings. To aid us in this matter we are now using a special ombremeter and scaled chart recording fluoroscopic findings.

Summary

(a) Artificial pneumothorax is of value not only as a palliative measure but also as a curative one.

(b) Although unilateral cases promise the best results, a moderate bilateral involvement does not contraindicate.

(c) Cases treated in a sanatorium give the best results; but this is not an absolute necessity.

(d) The skiagram and fluoroscope are essential.

(d) A small initial fill, not exceeding 500 c.c. of gas, and subsequent frequent refills not exceeding 1,000 c.c. are points of importance.

CLASSIFICATION	Totals	Right lung	Left lung	Unilateral	Bilateral	Palliative	Curative	Still under treatment	Still under treatment with fluid	Disease arrested	Improved	Failed	Died	Removed from observation	Treatment discontinued. Adhesions	Fluid	Death	Removed from observation	Duration of treatment 1 to 6 months	7 to 12 months	1 to 2 years	2 to 3 years	Earning a livelihood outside of institution
Incipient, A	1	—	1	1	—	—	1	1	—	1	—	—	—	—	—	—	—	—	—	—	1	—	1
Incipient, B	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Incipient, C	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	1	—	1	1	—	—	1	1	—	1	—	—	—	—	—	—	—	—	—	—	1	—	1
Moderately Advanced, A	21	8	13	12	9	9	12	15	—	11	8	—	2	—	3	1	2	—	7	4	7	3	6
Moderately Advanced, B	33	14	19	12	21	13	20	16	1	10	15	7	—	1	7	4	—	5	14	7	7	5	4
Moderately Advanced, C	1	1	—	—	1	—	1	—	—	—	1	—	—	—	1	—	—	—	1	—	—	—	—
Total	55	23	32	24	31	22	33	31	1	21	24	7	2	1	11	5	2	5	22	11	14	8	10
Far Advanced, A	10	5	5	1	9	6	4	6	0	4	2	3	1	—	3	1	—	—	6	1	3	—	1
Far Advanced, B	34	16	18	9	25	26	8	10	—	2	15	9	6	2	8	3	4	9	18	6	6	4	1
Far Advanced, C	31	11	20	3	28	30	1	8	1	4	9	6	11	1	5	3	10	4	13	8	4	6	3
Total	75	32	43	13	62	62	13	24	1	10	26	18	18	3	16	7	14	13	37	15	13	10	5
Summary	131	55	76	38	93	84	47	56	2	32	50	25	20	4	27	26	16	18	59	26	28	18	16
								58															
Percentages		42	58	29	71	64	36	44		24	38	19	15	3	20	20	12	14	45	19	21	13	12

THE AFTER-HISTORY OF WAR NEPHRITIS

WAR NEPHRITICS INVALIDED TO ENGLAND

By A. Rocke Robertson, *Captain, C.A.M.C.*, Medical Division
A. G. Fleming, - *Captain, C.A.M.C.*, Nephritic Ward
John C. Calhoun, *Captain, C.A.M.C.*, Laboratories
Ruggles George, *Captain, C.A.M.C.*, Eye, Ear, Nose and Throat

The Duchess of Connaught Canadian Red Cross Hospital
Cliveden, Taplow, Bucks

THERE have been published a number of excellent papers upon war or trench nephritis as it occurs in France, but the question of what eventually becomes of the patients has not been clearly worked out. The condition is usually regarded as a comparatively mild form of acute nephritis, and it is probably true that the majority of cases occurring in France and Flanders recover sufficiently in rest camps or field ambulances to permit of their return to the line. A minority of cases, those in which there is pronounced dyspnœa or extensive œdema, find their way into base hospitals in France, and here they are treated until those symptoms have abated or disappeared, and then are returned to England for further treatment. Of these a few are already free from albumin, casts and blood, but by far the greater number still afford traces of these pathological elements in the urine.

The present investigation was commenced by Captains J. D. Bruce and A. R. Robertson in the latter part of November, 1916, when a special ward for nephritis was opened. Captain Bruce, unfortunately, left shortly afterwards, and the work was then carried on by the writers, with the purpose of ascertaining the after-history of these cases.

To Captain Bruce and also to Colonel Rudolf, our thanks are due for many helpful suggestions.

While it is true that the mortality in acute stages is practically nil (any death that has occurred among such seeming almost

Received for publication June 5th, 1917.

always to have been due, not to a primary condition, but to exacerbations of an old nephritis), it is evident from the observations here recorded that the great majority of patients ill enough to be sent to England are still far from well at the end of three months. It is now necessary, we would suggest, that a further study be made of the condition of this class of patients at the end of say six months, and of a year.

We have been able to investigate a considerable number of these cases and for the purpose of this communication have subjected fifty to a detailed study—after a lapse of from two to three months or more from the onset. We have tried, by careful questioning as to the exact mode of onset and subsequent course in France, to ascertain what manner of case it is that fails to clear up quickly and tends to lapse into a sub-acute or chronic condition; this has revealed some interesting facts.

In our fifty cases we find that the average period of service in France was five and one-half months, that forty-three had done duty in the front line—either in trenches or gun positions—and that seven were never at any time in the front line,* but were on duty either at a base or only as far up as a rail-head. As to past illnesses, nine had had scarlatina in childhood, followed in one instance by severe nephritis; thirteen had had measles with no serious sequelæ, five had pneumonia, and five had rheumatic fever. In three cases there was a clear history of syphilis, which in two patients seems to have had some bearing upon their present condition.

All claimed to have been in perfect health upon arrival in France. All ate the same food and with the exception of three, who admitted having drunk trench water when other was not obtainable, stated that they had used only the water that was served out. It is, however, entirely probable that most soldiers at some time use trench or shell-hole water.

The most frequent initial symptom was acute catarrh of some part of the respiratory tract—trachaeo-bronchitis in twenty-seven, coryza in twenty-three and "sore throat" in seventeen. Rarely the entire tract was involved. Accompanying this, but usually following a short time after, was weakness and malaise in forty-four, and chills in twenty-five cases. Some degree of fever was probably present in all cases, but from the patient's own statement a history was obtainable only in twelve. Following this came dyspnœa in forty-

*Hence our preference for the term "war nephritis".

seven cases—in forty of which, it occurred in bed. Dyspnœa was also a fairly frequent first symptom. Then came œdemas of varying degree in forty-nine cases, occasionally only as a slight swelling under the eyes, or of the feet. In order of onset, œdema first occurred in the face and under the eyes, then in feet and hands. Accompanying, or often preceding the œdema, was headache of varying intensity in thirty-seven cases—of post-ocular or supraorbital character in twenty-five and occipital in three. In twenty-nine the headache was dull and constant, in nine it was sharp and lancinating. The commonest pain elsewhere was across the small of the back in forty cases, in the muscles of the legs in thirty-two. Abdominal pains were not infrequent, usually epigastric and of a cramping character in sixteen; in thirteen there were joint pains and in nineteen pains in the long bones. Nausea and vomiting was present in twenty-six cases. Vertigo, in thirty-one cases, was also quite frequently an initial symptom. Other symptoms that frequently followed were—loss of weight in twenty-five, insomnia in thirty-seven, anorexia in fifteen, diarrhœa in nine, constipation in eleven, profuse sweats in eighteen, dryness of skin in twelve, mental torpidity in ten, convulsions in three, and partial or complete unconsciousness in five. Visual disturbances occurred in eighteen, in one of which there was complete blindness, except for perception of light, over a period of about two weeks. Blurring of vision was the commonest occurrence and usually came on with the onset of œdema of the orbital tissues. Objects could be seen but their outline would be indistinct as would be the case in errors of refraction. In one case the patient volunteered the information that, whereas in good health he had always had to use glasses for reading, he was able to read quite easily during the time that orbital œdema was marked. It seems possible that a change either in intra or extra-ocular pressure, due to œdema of the eye or the orbital tissues temporarily altered the refraction of the eye.

The ocular changes that may have been present during the acute phase of our cases were probably those that have been commonly noted in France—œdema of the retina and the disc, phenomena which were occasionally noted in those that entered with œdema, or those in which œdema subsequently reappeared.

The commonest complaint upon entering this hospital was dull frontal headache, usually present upon awakening in the morning, and passing off towards mid-day. Accompanying this were pains across the loins, deep seated, dull, sometimes unilateral but usually bilateral and occasionally radiating downwards to-

wards the pelvis. It was not observed that the degree of pain bore any relationship to small fluctuations in the amount of albumin and blood (usually small) present in the urine. Dyspnœa on exertion has been a constant subjective symptom in all cases with one exception. That this is often real is amply borne out by the fact that some of the patients doing light duties on the ward become dyspnœic very quickly. In a few cases a transient dyspnœa would cause the patient to "start" with a smothering sensation out of deep sleep; such nocturnal attacks have, though, been rare and transient. However, the fact remains that the dyspnœa is even after too or three months from onset of the malady, such a constant subjective symptom that we have been endeavouring to ascertain to what extent this subjective symptom is confirmed by means of physical exercise tests. We have selected only those cases in which "shortness of breath" on exertion was a voluntary statement on the part of the patient, in no wise elicited by questioning. The patient was told that the physical exercise tests were of the nature of "pulse tests". Sufficient observations have not as yet been made from which to draw definite conclusions, yet we feel fairly sure that much of the dyspnœa in patients who have been free of œdema and high blood pressure for some weeks, with urine almost or entirely free of albumin and blood, is psychic or functional in character. It is well known that after recovery from nerve-paralysis following an injury there is often a greater or less amount of functional disability due to the patient's own impression that he cannot now use the muscles supplied by that nerve.

In a precisely analogous way it is possible that in many of these nephritics the early pathological dyspnœa is succeeded by a purely functional dyspnœa. Our observations upon this subject will be given in a further communication.

In all cases that we have examined after a lapse of three months we have found no enlargement of the heart—even in those few cases, in which there is still some increase of blood pressure and second aortic accentuation. In twenty-five cases seen after a lapse of three months there were four which showed a constant increase of systolic blood pressure—from 160 to 190—with accentuation of the second aortic sound. In two of these the œdema had been severe and prolonged with subsequent slight exacerbations on several occasions, the amount of albumin had been large, and there was much anæmia. A third case in a man over forty was more the picture of chronic interstitial nephritis that probably antedated the

War. The fourth was the only case in which there was severe albuminuric retinitis. His history is as follows:

No. 7211, Private R. S. M., K.O.Y.L.I. Was strong as a boy; measles at seven; no scarlatina or venereal history. A dental mechanic in civil life. Went to France June, 1916, and while in trenches suffered for two months from itching sores on legs, the pigmented remains of which we counted to the number of fifty-one. These we regarded as impetigenous. Was on light duty back at headquarters. Two weeks later, having lost his appetite and feeling very seedy, his face began to swell, then the hands and feet. He developed hacking cough, sore throat, and was nauseated and vomited. The abdomen then swelled, pain was severe in all muscles, the abdomen, and across the loins. Marked constipation. Previous to these latter symptoms and while on light duty at headquarters, he had nocturnal frequency, but never noticed any change in colour of urine. The œdema lasted fifteen days and during some part of this time the systolic blood pressure reached 200, and he was passing a slightly diminished amount of urine. Two weeks later there was a return of the œdema—almost as badly as on the first occasion. The eyesight became blurred, and a month later the oculist reported, "albuminuric retinitis of both eyes. Large area of retina involved, showing large atrophic spots more or less confined to the macular regions; also some small hæmorrhagic areas. Cannot see card at twenty feet." Six weeks later there were "comparatively few recent hæmorrhagic areas—most of them, particularly in the right eye, showing large areas of atrophy and pigmentation. Vision has improved immensely." Three months after onset he was feeling much better, but was pale, slightly puffy under the eyes, and had throbbing occipital headache in the morning. Sleeps badly and is very constipated. Heart normal in size; slight accentuation of second aortic sound. Systolic blood pressure, 150. Urine, twenty-four hours amount, 42 ounces; specific gravity 1017, acid, smoky; albumin, 0·3 per cent., urea, 1·2 per cent., chlorides normal; many hyaline and granular casts, red blood and pus cells.

In several cases there has been slight and transient return of œdema of the face, particularly under the eyes, and also of the extremities, accompanied by a feeling of lassitude, muscular pains, and deep-seated loin pains. In such cases there is usually some increase of the albumin, and often of blood in the urine. A remarkable case in which œdema of the hands has persisted in spite of all treatment and amelioration of other symptoms, is worthy of mention:

No. 310856: Gunner F. B., Canadian Field Artillery, was always previously healthy, a policeman in civil life, had previously been an iron-worker. Symptoms of nephritis began with vertigo upon getting up in the morning. Then he noticed nocturnal frequency, and shortly after developed frontal headache, insomnia, and gnawing pains in legs and arms, especially in the bones. Upon reporting sick, albuminuria was found. œdema of moderate degree in hands and feet only, no visual disturbances. Three months later there was still slight œdema of hands and feet of brawny character such as one sees in myxœdema. Thyroid extract over a period of two weeks had no effect. Upon exercise the swelling increases and diminishes after resting. Heart normal in size and function; second aortic sound not accentuated; blood pressure normal. He had only slight dyspnœa. Urine, three months after onset, about normal twenty-four hour amount, acid, pale; specific gravity 1015, albumin 0·05 per cent., a few granular and hyaline casts, red blood cells, and pus cells.

In almost all of our cases several complete examinations of twenty-four hour specimens of urine were made, with measurements of the "day" and "night" amounts as well. As most of the patients were up, even though under careful instructions to pass all urine into a specimen jar, it is certain that some was lost at stool, so that the amounts which we give are only relatively accurate. The average twenty-four hour urine for all cases was 1466 c.c.; the average "day" amount being 785 c.c. and the average "night" amount 703 c.c. in nineteen cases the amount passed at night was greater than that passed during the day. The urine was clear amber in colour in all but five cases which at some time passed "smoky" urine. In the majority of the cases the amount of albumin found was only about 0·05 per cent. The chlorides were about normal in all cases except one in which there was a transient decrease during an attack of migraine to which the patient had been subject for many years. The urea which averaged for all cases about 0·12 per cent was practically normal in consideration of the fact that all were on restricted protein diets.

In conclusion, we find that almost all cases invalided to this hospital from a base hospital in France show, after a period of three months, a trace of albumin, a few granular and hyaline casts, red blood cells, and pus. The chlorides and urea are about normal. Nocturnal micturition is present in nearly 40 per cent. of the cases, and there is probably a slightly greater amount passed during the night, between eight p.m. and eight a.m., than during the day.

Many still complain of dyspnœa, slight headache, pains across the lower part of the back, and a few develop slight transient return of œdema. They are usually very well nourished, and not anæmic; in fact there is usually a striking absence of the pale countenance so common in the ordinary nephritis of civil life. The blood pressure is usually normal, and there is no enlargement of the heart. Structural retinal changes are rare, having been seen in only one of our series.

A striking feature has been the fact that in over half of our cases there has been at the onset acute catarrh of some part of the respiratory passage, most frequently a bronchitis, which was usually regarded as simply a "cold". It seems probable that a test for albuminuria at this stage would have revealed the exact nature of the malady which, as a rule, was not diagnosed until hæmaturia or œdema came on. Therefore, it seems reasonable to expect that in a locality where this infection is known to be prevalent, if all cases reporting sick with "colds" were subjected to a simple quick test for albuminuria, many cases of early nephritis would be brought under treatment then, which otherwise would return at a later date in a condition less favourable for quick recovery and return to duty.

A FIRE occurred in the Grey Nunnery at Montreal on February 14th. Some time ago, part of the building was converted into a military convalescent home and at the time of the fire there were a number of "stretcher" cases among the two hundred soldiers then in the hospital. Fortunately, all were safely carried out of the building, although a few were injured by falling debris. There were altogether about a thousand persons in the institution. The fire broke out in the top floor, which was occupied by foundling infants and a number of these babies perished as the flames spread so rapidly that it was impossible to reach them. The cause of the fire is thought to have been a defect in the electric wiring.

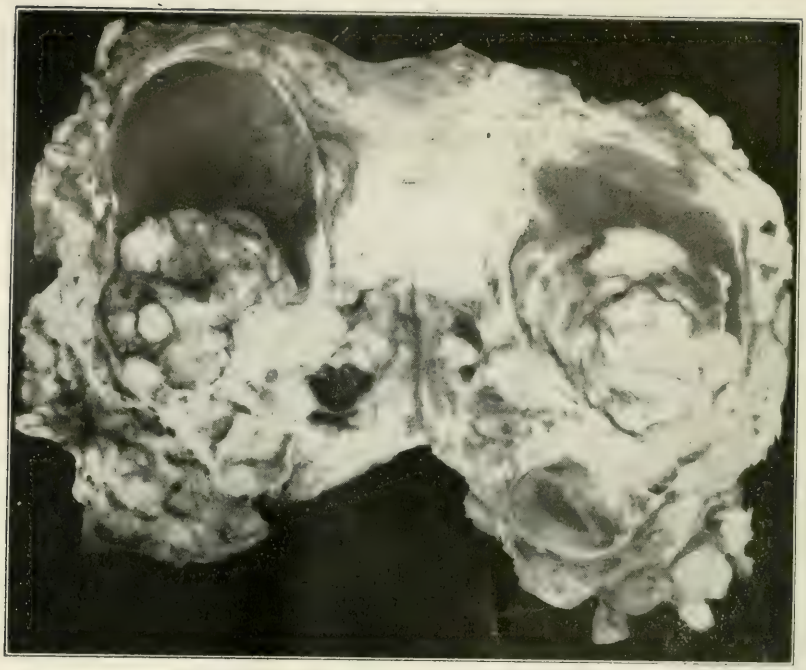

FIG. 1—Showing gross photograph of early Duct Carcinoma

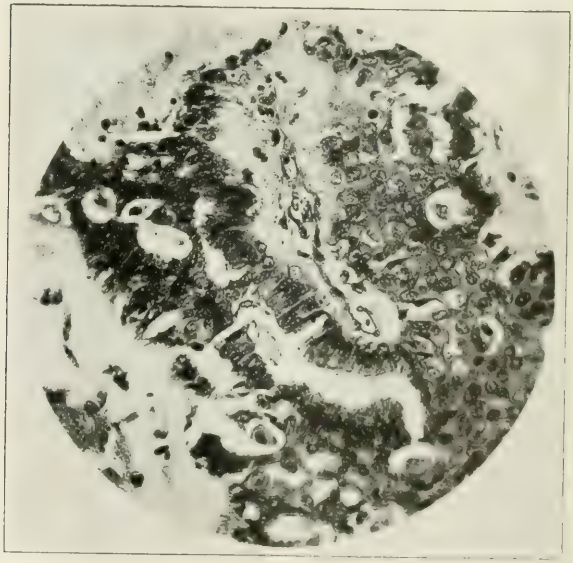

FIG. 2—Photomicrograph of section through base of Duct Carcinoma, showing infiltration and columnar type of epithelium

DUCT PAPILLOMA AND DUCT CARCINOMA OF THE BREAST

By Oliver R. Mabee

Assistant Surgeon, Toronto General Hospital

DUCT tumours arise from the epithelium lining the large ducts of the breast, or from one of these ducts which has become dilated and cystic. It seems quite certain that a fairly large percentage of these tumours show from the beginning a malignant tendency as evidenced by their invasion of the surrounding tissue. I have collected from the surgical records of the Toronto General Hospital, seven cases of duct tumours, and have added one case, which I recently operated upon, from my own records. In this series of eight cases five were duct papilloma and three duct carcinoma. In two of the malignant cases, there was infiltration of the surrounding tissues as well as metastases in the axillary glands. In these it was impossible to determine whether they were originally papillomata or not. In the third malignant case there is definite evidence that the tumour was originally papillomatous in nature.

The gross appearance is that of a papillomatous mass which projects into a large dilated duct. The surface is generally irregular and may have a polypoid, a fungoid, or a dendritic appearance. The papilloma is attached to the wall of a dilated duct whose surface is smooth. The lumina of the duct frequently contains blood or a thin bloody fluid which gives rise to one of the characteristic clinical symptoms, "bleeding from the nipple". When the growth is well advanced and there is marked infiltration of the surrounding tissue as well as gland metastases, its malignancy is apparent. In other cases it is necessary to make a careful microscopical examination to determine the presence of malignancy.

The microscopical appearance varies according to the size and the compactness of the mass. There may be small papillary projections covered with a single layer of columnar or cuboidal epithelium. Other areas show gland like cavities which are formed by the interlacings of the papillary projections. Where the tumour

Read by title at the meeting of the Ontario Medical Association, May, 1917.
Received for publication November 26th, 1917.

is compact and little stroma is present, the cells are more cuboidal in shape and packed closely together. In the malignant cases there is evidence of the growth invading the surrounding tissue and the presence of mitotic figures in fairly large numbers.

The following eight cases of duct tumours of the breast occurred in women whose ages varied from thirty-six to fifty-two years. Seven occurred in married women and 75 per cent. of these were in parous women. The clinical histories show no striking predisposing factors. The incidence of duct tumours compared with other breast tumours is shown by there being only seven recorded cases in a total of five hundred and twenty-nine breast tumours examined in the department of surgical pathology at the Toronto General Hospital during the last ten years.

The physical examination showed a tumour situated usually centrally in the breast, but sometimes, as in two cases, some distance from the nipple. They varied in size from a pigeon's egg to that of a small orange. In the benign cases the mass was localized, slightly irregular and moderately firm. Two of the malignant cases showed extensive infiltration of the surrounding breast tissue and gland metastases; the other malignant case showed an oval mass the size of a hen's egg and its malignancy was only determined by the use of the microscope. Retraction of the nipple and dimpling of the skin were present in only one of the malignant cases. Pain was present in four cases, varying in amount, being most marked in the malignant cases. Bloody discharge from the nipple was present in five cases. This varied in amount from being slightly blood tinged to almost pure blood. The bloody discharge was generally intermittent or could be obtained by gently squeezing the breast. In one case it was noticed first after the patient received a blow on the breast.

The surgical treatment of duct tumours of the breast, therefore, will depend upon whether they are malignant or benign. Bloodgood, in a series of cases reported, found that 50 per cent. were malignant. In another series, by Greenough and Simmons, only 15 per cent. were malignant. In my series, $37\frac{1}{2}$ per cent. were malignant.

In the literature several cases have been reported where the tumour has been removed through a small areolar incision. In some of these, local recurrence has occurred, as well as gland metastases. The above statistics show that one is not justified in removing the tumour alone. Microscopical examination should be made in every case, preferably during the operation. In my

own case a diagnosis of duct papilloma was made previous to operation. The mass was situated two and a half inches from the nipple and removed through a short curved incision. It was found to be slightly adherent to the pectoral fascia, which made me suspicious of malignancy. As there were no facilities for making a quick microscopical examination, the wound was closed. Later examination showed invasion of the surrounding tissues at the base of the papilloma, in the region where it was adherent to the pectoral fascia. Two days later, a radical operation was done in which the entire breast was removed and the axilla cleaned out. No secondary involvement of the axillary glands was found.

The tendency of papilloma in various other parts of the body to undergo malignant change is well recognized. This is also apparently true in duct papilloma of the breast and argues against conservative surgery in these cases. It would seem that at least a simple amputation should be done in cases which show no clinical evidence of malignancy. In the malignant cases the more radical the operation the less liability of recurrence there will be. In doubtful cases, microscopical examination will be the guide as to how radical the operation should be.

The new building of the Byron Military Sanatorium at London was formally opened by His Excellency the Duke of Devonshire on January 21st. The sanatorium was taken over by the Military Hospitals Commission some time ago for the treatment of tuberculous soldiers and it was decided to add a new building to the existing institution. A nurses' home has also been added and the kitchen facilities have been increased. On the occasion of the formal opening of the new building a bronze tablet was unveiled to the memory of the late Lieutenant-Colonel Edwin Woodman Leonard, Commander of the 12th Field Battery, who fell at Vimy Ridge. The tablet is placed in the dining room, which has been completely furnished by by Mr. F. E. Leonard, the father of Lieutenant-Colonel Leonard.

RUPTURE OF INTESTINES BY BLOWS UPON ABDOMEN

By J. S. Wright, M.B.

Edmonton

THAT one cannot begin to estimate the extent of the internal injuries following blows upon the abdomen, by external symptoms, or marks of violence to the abdominal wall, is a lesson I have learned from a number of cases of this nature that have come under my observation.

Most serious lesions may occur to the internal viscera following violence to the abdominal wall without any external symptoms, and, conversely, the abdominal wall may show extensive contusions and lacerations without any internal injury.

This being the case, in the diagnosis of lesions of the internal organs of the abdomen, following blows, the external evidence is a negligible quantity, and other symptomatic evidence must be considered, and that exclusively, in forming an estimate of the extent of the internal damage.

The architecture of the abdominal wall may be briefly outlined as follows: From before backward we have the linea alba in the median line formed by the folding of the aponeurosis of the oblique and transversalis muscles, then the strong recti muscles with their fibres running longitudinally from the cartilages of the fifth, sixth, and seventh ribs to the pubes, and enclosed in a sheath formed by the division of the aponeurosis of the internal oblique; the aponeurosis of the external and internal oblique muscles, and the transversalis. These muscles themselves, with their fibres running at all angles across the abdominal wall, and reinforced behind by the quadratus lumborum, and some fibres from the latissimus dorsi, completes the wall of the abdomen and places the viscera behind a strong barrier against external violence.

It is easily understood, how any organ more or less fixed, behind so strong a protecting wall, might be injured by external violence, but that the intestines hanging loosely from their suspending mesentery should be so injured is difficult to conceive, and

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Read before the meeting of the Alberta Medical Association.

indeed is still more difficult to understand when we consider that the muscle fibres of the bowel are arranged in circular and longitudinal bands which gives the strongest possible arrangement to the coats of the gut itself.

However, injury to the bowel by direct violence to the abdominal wall is possible under two conditions.

First, when the force is sufficient to carry the abdominal wall back so that the bowel is caught between the object producing the force, and the body of a lumbar vertebra. Here, of course, the position of the patient at the time of injury must be considered. When the body is inclined forward, the ability to withstand blows upon the abdomen is lessened owing to a degree of relaxation of the abdominal muscles, and the power of resistance will lessen just in proportion to the degree of stooping when the accident occurs.

In all industrial pursuits the position of the body during hours of labour is more or less that of stooping, and it is therefore more than probable that rupture of the bowel in these cases is caused in the manner stated.

Again, a weak, flabby abdominal wall would predispose to this form of injury, as the resistance of the wall in this case would be less than that of the well developed and muscular abdomen, and in individuals of this type the position at the time of injury would not be so great a factor as in the well developed muscular individual.

In automobile parlance the bowel is "rim cut".

A second possible condition in which rupture of the bowel might occur is that it is filled by a solid or semi-solid matter that offers sufficient resistance to rupture the gut before it can recede from the oncoming object producing the sudden blow to the wall. An accident of this nature could only occur some time after a full meal, when the intestines contained the maximum amount of fæcal matter, and would be most likely to occur when the body was in the erect position, as the bowel of necessity must be in contact with the abdominal wall.

A third possible condition I will mention and dismiss. That is, that rupture may occur by reflex stimulation of the intestinal nerves, through the nerve supply of the abdominal wall. Any blow upon the abdomen produces an instant tightening of the muscles, and it is not beyond a possibility that this tension is reflected to the intestinal coats to such a degree that spontaneous rupture occurs.

Diagnosis: As already stated the presence or absence of contusions, or other markings upon the abdominal wall, is a negligible quantity in the diagnosis of intestinal rupture due to blows, and the constitutional symptoms alone must lead to conclusions.

Rigidity of the abdominal muscles, pain of a severe type, a strained and anxious countenance, a varying degree of shock, and a rapidly increasing pulse rate, are sufficient signs to lead me to a very positive conclusion that serious trouble exists within the abdomen and to advise immediate operation.

Treatment in these injuries is purely surgical, where conditions at all warrant this mode of interference, and the chance of recovery is in the inverse ratio to the mnuber of hours intervening between the time of injury and the opening of the abdomen.

During the Boer war the method of treating gunshot wounds of the abdomen was expectant. The patient was placed in bed with the head raised was starved and given opium in some form, not only to control the pain, but to lessen peristalsis, hoping thereby to get a sealing of the wound and prevent the escape of bowel contents in abdominal cavity.

Not so the present war. Fauntleroy in the *Annals of Surgery*, August, 1916, states that small bullet wounds, where the wound of exit is no greater than the wound of entry, may be so treated, but all others require immediate operation. This he states is especially true of shrapnel wounds.

Dr. Joseph A. Beake, surgeon-in-chief to a large base hospital, somewhere-in-France, makes this statement: "I have seen remarkably good work done in a first aid base hospital situated in front of the big guns. In a twenty bed hospital, so situated, established in a laundry, I saw eight cases of resection of the bowel for multiple gun shot wounds, getting better. I firmly believe in easy interference.

A free incision, beginning just below the umbilicus and carried down to the pubes, is usually sufficient to examine the coils of intestines and locate the trouble. When located the further procedure will depend upon the condition of the bowel. If it is much lacerated the part should be resected and the ends united either by a Murphy button or sutures, the latter preferred, excepting in cases when speed is a factor. Lanes are closed in the ordinary way with Lembert sutures, care being exercised to reduce the diameter of the bowel to the least possible degree.

Small puncture wounds are satisfactorily closed by a purse-string suture, inverting the edges and placing a second row of Lambert sutures over the area.

The abdominal wound is closed from above downwards, and left open at the lower angle sufficient to admit a large sized cigarette drain or rubber tube, which is carried well down into the pelvis, the dressing applied and the patient returned to bed. Shock, always being present, in a greater or less degree, it is important to see that the bed is warmed, as the neglect of a minor detail like this, might easily turn the scales against the patient.

As soon as the effects of the anæsthetic have passed off, the head of the bed is raised and the patient remains in the Fowler position until the discharge ceases, or until all danger of infecting the upper abdomen has passed.

Case Reports

Case 1. Carpenter, age thirty-six, employed in sash and door factory, was sizing a piece of material on circular saw. Had pushed it through and was in the act of lifting it back when it slipped from his grasp, caught the saw and was driven violently into the abdomen. He received a knock-out blow for a few minutes, after which he got up and resumed his work for about one-half hour. The pain increasing, he was taken in an auto to his home where I saw him for the first time about two hours after the accident. On first examination no evidence of violence to the abdominal wall was present, the abdomen not even being reddened. The only symptoms present were a very rigid abdominal wall and evidence of pain, no particular disturbance of pulse, and temperature normal. However from the extreme rigidity of the abdomen and the pain the patient seemed to be suffering, I suspected serious internal injury and advised removal to hospital, which advice was rejected. Ordered heat to abdomen and told people I would return within two hours.

On my return just about two hours later, I found marked changes in the patient's condition. The face had taken on a pinched and anxious expression. The pulse rate had increased over twenty per minute and temperature was about 100°. The patient was told that opening the abdomen was imperative, and now readily consented to operation.

He was removed to the hospital and the abdomen opened by free incision; considerable fluid escaped, and on raising the abdominal wall two areas were observed thickly covered by lymph. On examining these it was found that at these two points the bowel was perforated and the deposit of lymph was nature's effort to close the break. The perforations were closed with a double

row of sutures, the area wiped out with dry sponges, a large cigarette drain placed in the lower angle of the incision, the wound closed and the patient returned to bed.

For four days this patient received nothing by mouth but sips of warm water at frequent intervals, after which he was given bouillon for the next two days.

On the sixth day a mild dose of oil was given which was effective, after which the patient was placed on soft diet for about a week, when the diet was increased gradually until at about the twentieth day from the accident he was getting a careful general diet.

As soon as the patient was out of the anæsthetic he was placed in Fowler's position and kept there for about three weeks. The recovery was tedious but uneventful, the patient leaving the hospital on the fiftieth day after operation.

Case 2. Stable-boy, age twenty-four, doing night duty in a stable where delivery horses were kept. About four o'clock in the morning when getting the horses ready for the day's work he was kicked in the abdomen. Lay in the barn until about eight o'clock when he was taken to his room where I saw him about ten.

On examination the only evidence of violence was a small, slightly reddened area. The patient was lying on the right side with the knees drawn up on abdomen. Pained and anxious countenance, rigid abdomen dull on persuasion, temperature 100·3°, pulse 120. I had no hesitation in arriving at a diagnosis of serious abdominal injury, and advised removal to the hospital and immediate operation, to neither of which would the patient consent at the time, and not until over thirty hours after the accident would he accept my advice.

On opening the abdomen large quantities of fluid escaped mixed with many lymph flakes. The intestines were inflamed and covered by deposits of lymph, which on being removed left bleeding surfaces.

The rupture in the bowel in this case was about eight inches from the ileo-cæcal valve in the ileum and was a longitudinal break of about one inch. This was repaired in the ordinary way with a double row of sutures, a large rubber tube placed in the lower part of the wound which was sutured from above downwards, the dressing applied and the patient returned to bed. The patient failed to rally after the operation and died about twenty hours later.

This young man's life was sacrificed through delayed operation. He had everything in his favour—youth, health and clean-

living—to insure recovery had the operation been undertaken when it was first advised.

Case 3. A lumber-jack, about the middle twenties, helping to haul a heavy freight-scow out of the water for repairs. In doing this a double block-and-tackle was used, with a one and one-half inch hemp rope. One hook was fastened to the scow and the other to a tree some distance from the shore, and the pulling end of the rope brought back to the donkey engine on a large tug. This chap was standing near the block attached to the tree when rope parted between him and the engine, the end coming back and striking him on the abdomen.

The accident occurred in the afternoon, and was about thirty miles distant from my office. A small tug was dispatched for me, but being away from my office when it arrived, I did not reach the patient until about twenty hours after the accident.

I found the patient lying on a bunk in the lumber shanty, with pained and anxious countenance, moderately distended abdomen, marked dulness in percussion, shock, rapid pulse, and temperature about 101°. My diagnosis was probable rupture of the intestines.

Deliberate operation was out of the question owing to his surroundings, and my being without assistance. Drainage seemed imperative if the chap was to have a fighting chance, and the abdomen was opened under cocaine by a small incision. Large quantities of fluid escaped, a gauze wick was carried down into the pelvis as well as it could be done, a dressing applied, and the patient returned to his bunk.

I remained with the patient until next day, using morphine freely, when he was taken aboard the tug and taken to the village. Being without a hospital he was kept in the company's boarding house, where for a week he put up a splendid fight for life. Finally he began to improve and was able to be about in about ten weeks, but with a fæcal fistula. About six months later the abdomen was opened and the gut repaired and the chap, so far as I know, is still living.

I consider that this chap recovered owing to my good fortune in making the original incision directly over the rupture in the intestine as I discovered at the subsequent operation.

Cases 1 and 2 are in no way different from hundreds of cases surgeons, the world over, might report, and are here reported for the purpose of bearing out the statement made at the beginning of this paper that the chance of recovery is in the inverse ratio to

the number of hours intervening between the accident and the operation. Both of these men were young and healthy and at the time of the injury had equal chances for recovery, time being the only factor in the subsequent outcome. Case 1 was in bed after the operation within six hours from the time of injury, and recovered. Case 2 was not operated upon until over thirty hours after the injury, and died.

Case 3 is a striking demonstration of what nature will do for a patient if given half a chance. It would be extravagant to claim that the operative procedure in this case did anything more than give nature a chance to do its work, and in this particular case the work was well done.

A NOTICE has been sent by the New Brunswick Board of Health to all milk dealers requesting them to forward to the Board suggestions concerning the best way of providing for the pasteurization of all milk sold in the province. Some of larger dealers have already instituted this procedure but the cost of a pasteurizer makes it impossible for many of the smaller venders to do this. It has been suggested that the latter might coöperate in the purchase of a pasteurizer or that one dealer should undertake to pasteurize milk for other dealers at a fixed price.

Case Reports

TRAUMATIC RUPTURE OF THE JEJUNUM

Operation—Recovery

By L. Bruce Robertson, B.A., M.B., *Major, C.A.M.C.*

No. — Canadian Casualty Clearing Station, B.E.F.

THE following case of traumatic rupture of the jejunum is of interest from its severity and complications, as well as its fortunate issue:

Gunner H——, West Lancashires, age thirty-nine years, while walking along the road from V——, was run over by a three ton army lorry at about five p.m. on December 17th, 1916. He was admitted to the Casualty Clearing Station at 9.30 p.m., and stated that the front wheel of the lorry had passed over his body about the level of the lower border of the chest, and that the vehicle had been stopped just as the rear wheel struck him. On admission he was in considerable thoracic and abdominal pain, the latter being localized in the epigastrium and left hypochondrium. No bruising of the chest wall or abdomen could be made out on the closest inspection, and it seemed almost impossible that even the front wheel of an army lorry could have passed across the abdomen. Pressure over the lower left ribs caused acute pain and he breathed with an expiratory grunt. Examination of the chest showed slightly suppressed breath sounds only, at both bases. No fracture of the ribs could be detected. Moderate rigidity of the upper half of both recti was present. There was no sign of free fluid in the abdomen. Pulse was 88 and of good quality. Blood pressure was, systolic 120, diastolic 80 m.m. Hg. Urine contained no blood. Patient stated that he had vomited two or three times prior to admission. As he was very much chilled, it was thought advisable to get him well warmed and keep him under close observation. One hour later the pulse was still 88 and the abdominal signs unchanged. Two hours after admission the pulse rate was the same, but the patient had vomited twice. There was an increase in the abdominal rigidity and there were signs of fluid in the left flank.

Operation was decided upon. Under ether anæsthesia a long

Received for publication May, 1917.

left rectus incision was made above the umbilicus. On opening the peritoneum dark bloody fluid appeared in moderate amount. There was no injury to spleen or liver. The left side of the great omentum was so badly torn that a portion about six inches square had to be removed. There was an oblique tear through more than half the circumference of the jejunum, about eight inches from the duodeno-jejunal flexure, the tear extending downwards and forwards from the mesenteric border. The mucous membrane was very much everted and swollen. For about six inches on either side of the rupture the bowel was purplish and œdematous. The mesentery opposite to the tear was torn and bruised from the gut to the base on its antero-superior aspect. The exposed mesenteric vessels were much dilated, but none of the large branches torn through or thrombosed. There was comparatively slight extravasation of intestinal contents. The jejunal tear was closed with two layers of linen suture, mesentery repaired with catgut, pelvis cleaned of blood and intestinal contents, and mopped out with "eusol". A suprapubic drain was introduced and the abdominal wall closed in layers.

On account of the evident damage to the gut and the possibility of paralysis at the site of the injury, resection was considered, but, as the œdema and discoloration extended to within such a short distance of the duodeno-jejunal flexure, it was thought to be too long a procedure. For the same reason the idea of gastro-enterostomy was dismissed, as the patient's condition after opening the abdomen, did not justify any but the shortest operative measures.

Two days after the operation he developed a lobar pneumonia of a severe type, the left lower lobe being affected. This condition, however, was not unexpected, on account of the injury to his chest ("contusion pneumonia") and subsequent exposure, in addition to the retardation of the movements of his abdominal wall and diaphragm.

The abdominal condition cleared up rapidly, apart from some troublesome diarrhœa which persisted for a few days. The chest condition gave him extreme discomfort and at times he became cyanosed and dyspnœic. At these times he obtained immense relief through the administration of oxygen by means of a nitrous oxide bag and face mask, such as is used in cases of poisoning by the German "drift" gas. The removal of the pelvic drain after four days was followed by a foul smelling discharge from the pelvis, which persisted for a few days. Two weeks after operation, when the chest condition had practically cleared up, he was evacuated to

a base hospital, where he remained for a week before being sent to England. At this time his wounds had healed and his condition was improving rapidly. When last heard from (January 27th, 1917) he was up, and "making rapid strides toward recovery", to quote his own words.

In reviewing the history of the case, it appears that the front wheel of the lorry must have passed completely across the abdomen, crushing the jejunum and great omentum against the prominent vertebral column. The comparatively small amount of extravasated intestinal contents present, in view of the large rupture of the bowel, was probably due to a traumatic paralysis of the latter. Although the blood pressure at the time of admission appeared to be practically normal, it was found later that his normal blood pressure was much higher, so that the first reading showed really a lowered blood pressure.

Two similar successful cases of traumatic rupture of the jejunum near the duodeno-jejunal flexure have been reported recently. In the first one[1], some twenty hours had elapsed before the patient was admitted to hospital for operation. There was a tear two and one-half inches long in the jejunum, twelve inches from the flexure, and general peritonitis was present. The lacerated bowel lay far back in the left flank near the spleen. The mesenteric border was not torn, but there was a good deal of bruising of the mesentery. The opening in the bowel was closed with two layers of fine black thread. The patient made a good recovery.

In the second case[2] the jejunum was torn completely across about six inches below the flexure. Resection was considered but not carried out on account of the additional shock involved. End-to-end anastomosis was done, the abdomen washed out with saline, and a pelvic drain introduced. The patient made a good recovery.

A point of great interest in these cases is that it is often possible to avoid resection, in spite of the apparent bruising and œdema of the bowel This shortens the operation and lessens the shock The importance of removing as much as possible of the intestinal contents from the peritoneal cavity is also emphasized in these two reports.

For the opportunity of reporting this case, I am indebted to Lieutenant-Colonel J. E Davey, C.A.M.C.

References:

1. R. P. Rowlands, *Lancet*, February 26th, 1916.
2. W. Sampson Handley, *Lancet*, January 20th, 1917.

REPORT OF SIX CASES OF TONSILLECTOMY IN DIPHTHERIA CARRIERS

By C. C. Ballantyne, M.B. (Tor.)

Captain, C.A.M.C., Moore Barracks, Canadian Hospital, Shorncliffe

AND

B. S. Cornell, M.B. (Tor.)

Lieutenant, C.A.M.C., No. 2. Canadian Mobile Laboratory, Folkestone.

DURING the months of June and July, 1917, at Moore Barracks, Canadian Hospital, Shorncliffe, about fifty cases of diphtheria and diphtheria carriers were treated. The so-called carriers particularly presented a problem in that persistent treatment failed to eliminate the germ. Accordingly, tonsillectomy was resorted to in some of these carriers, and herewith is submitted a report of six cases in which the operation was performed. While no originality is claimed for the treatment, the results may perhaps prove interesting.

The technique was as follows:

The tonsils were completely enucleated by the dissection and snare method, and swabs were at once taken from the oral surfaces of the removed tonsils. Then after thoroughly cleansing the tonsils externally with alcohol and ether, cross sections of the gland were made at three different levels with sterile knives. Swabs were at once taken from the crypts at each of these different levels, the first being one-eighth of an inch beneath the oral surface, the second at the centre of the tonsil, and the third one-eighth of an inch from the capsule. Hypertrophied adenoids, when present, were also removed, sectioned, and swabbed in a similar manner. The swabs were immediately planted on Loeffler's blood serum media, incubated for twelve hours and the resulting growths examined for the bacillus diptheriæ.

Case 1. Private W., admitted suffering from peritonsillar abscess which readily subsided after incision. On May 24th, as

a result of routine swabbing, he was found to be a diphtheria carrier. Until June 12th, swabs were invariably positive and on that date tonsillectomy was performed. Swabs from the tonsil showed:

Right. Surface, positive; top section, negative; middle section, negative; bottom section, negative.

Left. The same as right.

Adenoids. Surface, positive; section, positive.

Subsequent throat swabs—three successive negatives on June 15th, 18th, and 20th.

Case 2. Private M., admitted as a carrier and for six weeks numerous swabs were repeatedly positive. Tonsillectomy on June 12th.

Right. Surface, positive; top section, positive; middle section, negative; bottom section, negative.

Left. Surface, positive; top section, positive; middle section, positive; bottom section, negative.

Subsequent throat swabs: successive negatives on June 15th, 18th, and 20th.

Case 3. Private S., admitted with mild tonsillitis which readily subsided in forty-eight hours without antitoxin. Routine swab June 3rd positive for diphtheria and repeated subsequent swabs positive. Tonsillectomy June 12th.

Swabs from tonsils showed:

Right. Surface, positive; top section, positive; middle section, negative; bottom section, positive;

Left. Positive throughout.

Three successive negative swabs were not obtained until June 26th, 27th, and 28th.

Case 4. Private T., admitted June 17th as a carrier. Swabs persistently positive. No constitutional reaction. Tonsillectomy on June 29th. Swabs from tonsils showed:

Right. Positive throughout.

Left. Positive throughout.

Three successive negatives obtained July 6th, 7th, and 9th.

Case 5. Private O. H., admitted May 25th as diphtheria carrier. Swabs invariably positive. Tonsillectomy June 21st. Swabs from tonsils showed both tonsils strongly positive throughout. Three successive negatives were obtained June 23rd, 24th, and 25th.

Case 6. Private Z., admitted June 5th with mild diphtheria which readily responded to 12,000 units of antitoxin. Swabs posi-

tive persistently till June 29th. Tonsillectomy June 29th. Swabs from tonsils showed:

Both tonsils strongly positive throughout. Successive negatives obtained July 3rd, 4th, and 5th.

In these six cases, the operation obviously accomplished the object for which it was undertaken. Although, in some the organisms persisted for a few days after operation, they disappeared with the healing of the wound. In all these cases, saline irrigations and gargles had been continuously used until the time of operation and their failure is explained by the pathological findings, since in four of the six cases, the bacilli were found in the very depths of the crypts and surface applications could not be expected to reach them.

Living cultures of staphylococcus pyogenes albus had also been employed as sprays over the tonsils in the hope of outgrowing the diphtheria bacillus, and it was usually found that swabs taken next day were negative for Klebs-Loeffler organisms but were loaded with staphylococci. The bacilli, however, reappeared in large numbers within a day or two. The probable explanation is that the large numbers of staphylococci collected in the first swabs had outgrown the bacilli on the media. If, however, the staphylococci outgrew the bacilli on the tonsils, then fresh organisms were soon resupplied from the tonsillar crypts.

From the findings in the above six cases then, one may draw the two main conclusions:

1. That in apparently normal individuals, the bacillus diphtheria may be harboured in the depths of the tonsillar crypts.

2. That complete enucleation of the tonsils seems to be a successful means for eliminating diphtheria organisms from carriers, although it appears too drastic a measure for routine adoption.

REPAIR OF NOSE BY TRANSFERRED FLAP OPERATION WITH INCLUDED BONE-GRAFT

By Edmund Boyd, M.B.,

and

W. E. Gallie, M.B.

Toronto

THE patient, G. J., was referred in January, 1917, having met with an accident at a mining camp, in which he was caught between an elevator and the flooring. The injury was very severe, the crush coming mainly between the eyes. The skull and the right malar bone were fractured, the right orbital plate being displaced downwards, carrying the eye. The nose was crushed in level with the cheeks.

When seen by us some four months afterwards, the condition was as follows:

The bridge of the nose was totally absent, leaving a large fistula, one inch by three quarters of an inch into the interior of the nose, into which one's thumb could readily be placed. The lower half of the nose was flattened and twisted crosswise. The septum was lying crosswise and occluding both nares. A slight purulent discharge was coming from the right ethmoidal region. The left eye was in normal position, but the skin of the inner canthus was drawn together and cicatricial. The right eye was displaced downwards, the inner part of the eyelids being drawn together and nearly all scar tissue. The skin about the fistula was thin, cicatricial, and not of healthy vascularity.

After consultation it was decided to attempt to repair the nose, and close the sinus by a transferred flap from the arm with included bone graft; this was carried out in the following stages:

1st Stage. Under anæsthesia, the remnant of the nose was freed and moulded into position; the septum, which had been crushed to a Z-like shape was restored to position and splinted; the ethmoidal regions were cleared. A sequestrum of the right nasal bone was found impacted in the right cells (this being the cause of the purulent secretion). The openings of the frontal

sinuses were ensured of patency. The splints were left *in situ* for fourteen days.

2nd Stage. Under anæsthesia, the nose was readjusted and resplinted. The ninth rib on the right side was now exposed, and the superficial half of a piece, one and one-half inches long removed with the periosteum. This piece was folded on its long axis with the periostium outside and tied with cat gut. This was implanted under the skin of the dorsal surface of the left arm, about four inches from the wrist. The folded edge lying deeply; it was left for three weeks.

3rd Stage. Under anæsthesia, the edges of the sinus, except the lower, were cut away until healthy tissue was reached, and redundant granulation at other parts was removed. A flap of skin, including bone graft and deep fascia was now made from the arm, large enough for shrinkage and with a wide base to ensure proper blood supply. This was turned up and placed in position over the fistula, its free end meeting the upper edge. A part of the frontal bone was now chiselled out and the end of the bone graft fitted into it; the flap was united by horse hair sutures to the edges as far as it was possible. Dressings were applied, and the arm and shoulder fixed in this position by plaster bandages. This was left for nineteen days.

4th Stage. Under anæsthesia, the plaster was removed. The flap which had firmly united, was cut off at the base and sutured to the lower part of the sides of the fistula. As the lowest part which was now protruding had established a good circulation, it was decided to leave it for the time being until the rest of the flap had perfectly united. This was trimmed and united four weeks later.

The recovery was eventually perfect. A small sinus existed at the upper part for a short time, from which a purulent discharge came from the right orbital region. The healing on the internal surface was good, union place taking between the bony surfaces in contact, with no discharge at any time. The surface condition now shows the fistula closed by a solid bridge of tissue level with the cheek surface. He has good and adequate nasal breathing.

It was intended to improve the cosmetic result, by superimposing bone grafts to make a bridge, but the result as it stands is so good, and the patient is so well satisfied—that it seems wiser not to proceed further.

Lieutenant-Colonel John McCrae, B.A., M.B., M.R.C.P.

Canadian Army Medical Corps, British Expeditionary Force.

Born November 30th, 1872—died January 28th, 1918.

Editorial

LIEUTENANT-COLONEL JOHN McCRAE, B.A., M.B., M.R.C.P.

Canadian Army Medical Corps, British Expeditionary Force

IT has been said that John McCrae was the most talented man in the medical profession in Canada, and that is probably true. By that we mean that over and above his undoubted ability in general medicine he possessed talents of varied order, which he at least did not wrap in a napkin and hide. His reputation as a poet is already established on both sides of the Atlantic. His knowledge of general subjects such as history and biography, military work, and general literature, both French and English, was unusually extensive. Though no musician, he had a keen ear for music; though no artist he could do well in simple line drawing. He had travelled extensively, and was familiar with Europe, particularly England and France, but going also as far east as Roumania. He had served his country with distinction in the Boer War as a combatant, winning his majority and the command of an artillery brigade. In this war he also served his country to the full measure of his ability from the very moment that war was declared up to his death. He died on January 28th last at No. 14 General Hospital, in Wimereux, after an illness of four days, of a virulent type of pneumonia complicated by meningitis. The wards in the winter time are full of it, and in France pneumonia has been of a very serious type, speaking generally. Doubtless he got it during the performance of his duty. He always felt keenly that, though his activities were necessarily confined to the Medical Corps he was working as much on active service and

on the field as any "soldier". Once, while making rounds in his huts, one of the men thoughtlessly called him "doctor". McCrae was quick in the answer. "Don't call me doctor", he said. "I'm as much a soldier as you are."

The military instinct in him was strong. Punctuality, discipline, unquestioning obedience, the subordinating of self to the general need of one's country, detestation of slackness, tenacity, the complete fulfilment of one's duty—these were cardinal virtues in his eyes—and he followed them. One privilege of the soldier, the traditional privilege of "grousing", he allowed himself, but his grousing was never about hardships. Of these he took his share, and sometimes more than his share. When as a Field Officer he might have had a room in a hut with a coal fire, he preferred to stick to his tent. This was no Spartan love of hardship, for he was rather sensitive to cold and was subject to attacks of bronchial asthma; it was rather, as we believe, a vague feeling that he did not desire comparative luxury while the men were enduring discomfort.

He was born forty-five years ago in Guelph, Ontario. At the age of fourteen, as he sometimes remarked with a slight tinge of pride, he was already in the militia. He took his B.A. degree at Toronto, and went on to his M.B. at the same University, graduating in the year 1898. After graduating he followed the work of Professors Welch and Osler at the Johns Hopkins Hospital, and later went to London where he took his degree of M.R.C.P. He came to McGill University as Fellow in Pathology in 1902 under Professor Adami, and later became successively Resident Pathologist to the Montreal General and Assistant Pathologist to the Royal Victoria Hospital. In 1905 he left pathology and became associated with the chair of clinical medicine as Lecturer in the University and Assistant Physician in the Royal Victoria Hospital, which posts he still held at the time of his death.

At the outbreak of the war he was on the ocean, on the road to London for his summer holiday. Just before sailing from Canada, a letter was received from him saying that

he hardly liked to leave at that moment and be out of touch with the world for ten days, for he thought war might break out at any moment. His fear was justified. On arriving in England, he immediately cabled back to Headquarters an offer of his services either as a combatant or in the C.A.M.C.

Returning immediately to Canada, he was made M.O. to the 1st Brigade of Field Artillery, went with them to Valcartier and crossed with the first contingent. His later letters described the mud and cold and wet of Salisbury Plain, the crossing to France, the early Canadian engagements, the terrific, and at that time quite new, intensity of the artillery fire at Neuve Chapelle, and finally the fiery ordeal through which the Canadians passed at the second battle of Ypres. There he did splendid work among the wounded not only of his own but of neighbouring units, and had several very close escapes from shells while running from his own dugout to those of neighbouring brigades to tend the wounded. His Colonel, now General Morison, was an old comrade of the Boer War, and a kindred spirit. McCrae was in his element in the second battle of Ypres—a righteous and fierce defensive fight against unprovoked aggression and heavy odds. The Canadians literally saved France that time, when they stopped the gap left by the Senegalese who had given way before the awful gas. And the first Field Artillery Brigade had a glorious share in that fearfully hard fight.

Early in May, McCrae was recalled to base to assume the duties of Lieutenant-Colonel in charge of the medical side of No. 3 Canadian General Hospital, familiarly known in Canada as Colonel Birkett's unit or the McGill Hospital. With it he crossed again to France on June 19th, 1915, and with it he served continuously till his death on January 28th, 1918. His outstanding ability came gradually to recognition among the consultants of the Boulogne area; so that just a few days before his last illness he was appointed medical consultant to one of the English armies in France. This was an absolutely

unexampled distinction for a Canadian to attain to over there; and it is a melancholy satisfaction to us, his close friends, that "Jack" had received such a signal honour before death claimed him.

Any detailed recital of the work he had accomplished in his forty-five years of life would be too long for this place. In his profession, he was a physician beloved by all his patients; to the sick poor in hospital always faithful and kind; to the students an ideal teacher, one who had his wide knowledge of pathology and of medicine thoroughly classified and clarified, and who could fasten that knowledge in the student's mind with the nail of the picturesque phrase. He had a phenomenal memory both of facts and of words; and this, with a fundamental love of humour, made him one of the best story-tellers in Canada. He was, wherever he went, a great social favourite. His name will live in poetry. The help to recruiting and to Victory Loans brought by his "In Flanders' Fields" was certainly enormous.

In medicine he had already risen to a noteworthy position, as a consultant in Montreal, as a hospital physician, as a teacher, and as a writer. The text-book of Adami and McCrae in "Pathology" is to-day easily one of the best and most widely known. His original articles on "Inflammation", on the "Pathology of Burns", on "Scarlet Fever", on the "Use of Subcutaneous Oxygen in Pneumonia", and others, are all valuable. His industry was great, his ability to make use of the "odd half-hour" was phenomenal. The bulk of his analysis of over eight hundred cases of scarlet fever was done in such odd half-hours.

Finally as a friend, and he had many, what can one say? His friendship was loyalty to the *nth* term; and it was, over and above that, charm, and humour, and wit, and information and stimulation, and general kindliness.

Following are the two poems that have made Lieutenant-Colonel McCrae's name a household word wherever the English tongue is spoken:

IN FLANDERS' FIELDS

In Flanders' fields, the poppies blow
Between the crosses, row on row,
That mark our place; and in the sky
The larks, still bravely singing, fly,
Scarce heard amid the guns below.

We are the dead. Short days ago
We lived, felt dawn, saw sunset glow,
Loved and were loved; and now we lie
In Flanders' fields.

Take up our quarrel with the foe!
To you, from failing hands, we throw
The torch. Be yours to lift it high!
If ye break faith with us who die
We shall not sleep, though poppies blow
In Flanders' fields.

THE ANXIOUS DEAD

O guns, fall silent till the dead men hear
Above their heads the legions pressing on;
(These fought their fight in time of bitter fear
And died not knowing how the day had gone.)

O flashing muzzles, pause and let them see
The coming dawn that streaks the sky afar;
Then let your mighty chorus witness be
To them, and Cæsar, that we still make war.

Tell them, O guns, that we have heard their call,
That we have sworn, and will not turn aside,
That we will onward till we win or fall,
That we will keep the faith for which they died.

Bid them be patient, and some day, anon
They shall feel earth enwrapt in silence deep,
Shall greet in wonderment, the quiet dawn,
And in content may turn them to their sleep.

THE work of the Canadian Army Medical Corps in the past year, and the great improvements that have been effected in this branch of the service, are set forth in a report recently submitted by Surgeon-General Foster, Director of Medical Services, to the Overseas Minister of Militia. The work of the Army Medical Service is considered in two parts, the professional and the military.

Reviewing the principal items of constructive improvement made in the Canadian Army Medical Service in England during 1917, the report states that the following units were organized or reorganized: Ten general hospitals, eight special hospitals, six convalescent hospitals, one ship hospital, two laboratory units, four sanitary sections, one central medical stores, two advance medical stores, one regimental depot and training school, two administrative units,—a D.M.S. branch and a D.M.S., London area.

In the reorganization, the report declares, the personnel was thoroughly sifted for the release of men fit for general service and their replacement by men of lower categories. Nearly the strength of a battalion, 917 men, were released to the combatant forces in this process. The report adds: "A definite and fair policy has been adopted governing the selection of all ranks for the service in France. A fair and just policy has been adopted governing the promotion of all ranks."

The net total expansion is 11,432 beds. Including hospitals temporarily closed down during their removal, the total Canadian hospital capacity is now 19,950 beds.

An average of more than 6,000 sittings of medical boards was held per month, and an average of more than 14,000 troops per month reviewed for classification.

A REPORT on health conditions in St. John, New Brunswick, has been prepared by Mr. John Hall at the request of the provincial government. After careful consideration of conditions, certain conclusions have been reached which

have been made the basis of a number of recommendations. The report states that it is not to be expected that all of these recommendations can be put into effect at once, nor can some of them be adopted without additional legislation by the provincial authorities, but they form a plan, which, if followed, would give the city and county of St. John, modern and effective means for protecting health. Among these recommendations are the following:

That the chief district health officer be paid a salary consistent with the duties he is expected to perform and that he devote his whole time to the work.

That the health department be provided with an automobile for the use of the health officer and his staff.

That the Vital Statistics Law be enforced.

That the registration of births, marriages and deaths for the city and county be placed under the direction of the chief district health officer.

That a so-called spot-map be used in the office to indicate the location of cases of the reportable diseases.

That the General Hospital be repaired and considerably enlarged and that provision for maternity cases be made there.

That laboratory facilities be secured either through the local or provincial boards of health for making complete examinations of water and milk and for making diagnoses from proper specimens in cases of diphtheria, tuberculosis, typhoid fever, malaria and venereal disease.

That a refrigerator be provided for vaccine and that it also be used for a supply of diphtheria antitoxin and antityphoid serum, to be supplied free to those unable to pay, and at cost to any one else.

That the board of health, the Victorian Order of Nurses, the Children's Aid Society, the hospitals, and all other organizations engaged in welfare activities coöperate in every way, so that the best work can be done with the utmost efficiency and the least overlapping and delay.

That a system of medical inspection of school children be adopted with a part time physician and a full time nurse in the employ of and under the control of the local health department.

That a trained nurse familiar with public health work be added to the staff of the health department, to inaugurate and carry out prenatal and infant welfare work.

That a campaign of publicity and education be carried on through the schools and the press, by means of exhibits, lectures and circulars of information, and that the important facts of hygiene and health be brought to the attention of the public in every possible way.

Other recommendations are contained in the report, in respect to sanitary conditions, the milk supply, etc. Reference is made also to the importance of gaining the coöperation of the people and of giving them information and advice on health topics.

It is expected that the question of the establishment of a department of public health will be brought up during the present session of the provincial parliament. The subject was discussed at a meeting of the provincial government on February 7th, last.

A REPORT of the year's work of the health department was submitted to the Manitoba Legislature on February 8th, by Dr. Armstrong, the provincial secretary. It will be remembered that the work of the Manitoba Board of Health was reorganized two years ago. This was the first report of a full year's work presented by the Board.

In 1916, as the funds at the disposal of the Board for the purpose were insufficient to permit of the employment of permanent nurses, an arrangement was made in the municipalities of Assiniboia, Rockwood, Dauphin, Portage la Prairie, Brandon and Dauphin Town, by which the municipality, the school board and the government each paid one-third of the cost of a district nurse. It is hoped that a

similar arrangement may be made in other places in the province. In these six out of one hundred and fifty municipalities in the province of Manitoba, 9,304 children were examined and it was found that 25 per cent. had defective teeth, 20 per cent. had enlarged tonsils, 16 per cent. were suffering from adenoids, in 12 per cent. vision was defective, 8 per cent. had enlarged glands, in 3 per cent. hearing was defective, and 2 per cent. were suffering from skin affections. Four thousand, six hundred and ten houses were visited, where instruction was given to families in sanitation and child welfare work. Fifty-five cases of incipient tuberculosis were discovered and thirty-six cases of advanced disease referred for medical treatment. In Brandon, the deaths of children under two years of age caused by diarrhœa and enteritis were reduced from thirteen in 1916 to three in 1917.

In other parts of the province four nurses were employed by the Board for emergency calls and educational work, but as they were unable to stay in one district longer than from six to eight weeks their accomplishment was necessarily limited. For instance: it was possible to examine only 12,179 children out of the 77,278 registered in the province and only one hundred and sixty out of the 1,582 schools in the province were visited; these figures apply to the whole province with exception of Winnipeg. It is hoped, however, that it will be possible to extend the work until provision has been made for the medical examination of every child and also for the free treatment of those whose parents cannot afford to bear the expense.

The situation as far as tuberculosis is concerned is shown by the fact that of three hundred and seven cases admitted to the Ninette Sanatorium during the year 1917, one hundred and fifty-five were already far advanced in the course of the disease and fifty-one were apparently hopeless; sixty-one were moderately advanced and forty were incipient. During December, of the twenty-five cases admitted, eighteen

were advanced, one was hopeless, four fairly advanced, and two incipient. It was pointed out in the report that as long as the majority of the cases upon admission were already in an advanced stage of disease, the results of treatment could not be other than they are at present and the rate of mortality would remain at its present high level. The early detection of the disease was the only way to improve existing conditions and to diminish the number of cases, and one of the ways of accomplishing this was through the work of district nurses whose duties would take them into the homes of the people. The annual grant made to the sanatorium by the rural municipalities was recently increased from $25,000 to $50,000.

A PLAN has been evolved by the American Association for the Study and Prevention of Tuberculosis, working in conjunction with the Surgeon-General of the United States Army, the Y.M.C.A., and other agencies, whereby full information may be tabulated as to the whereabouts, condition, etc., of every tuberculous soldier discharged from the army or the navy, and an educational campaign inaugurated among soldiers and sailors concerning tuberculosis and its prevention. Inasmuch as enlisted or drafted men do not become accepted soldiers until after a preliminary period, lasting from three to six months, in the various services, the American Government assumes no responsibility for the aftercare of those whose health breaks down during that period, and this problem, therefore, must be solved by civilian health boards and unofficial health organizations.

When the names of men dismissed from the services because they were suffering from tuberculosis have been ascertained, they are forwarded to the health boards and associations in the states in which the men reside for follow-up work; and should there be no existing facilities for this work, the efforts of the association are directed towards their establishment.

In accordance with a general policy recommended by the National Association, steps have been taken by the medical department of the American Army to weed out cases of tuberculosis, and every man now passed by the draft board after going into camp is examined by the regimental surgeon, reëxamined by a tuberculosis board, and if suspected to be suffering from the disease, again examined by a expert in tuberculosis.

Since it is known that a number of men have been accepted into the services who are suffering from tuberculosis and who, in some cases, had already undergone a period of treatment in sanatoria, the association has compiled lists of all recent male patients of draft age in the various sanatoria in the country, with a history of the cases and information as to whether or not, so far as can be ascertained, the men are in the army. This information has been forwarded to the training camps and a number of these men have been traced.

The Association is also coöperating with the Government in providing sanatorium accommodation for men who have been discharged from the services during the probationary period. Whenever possible, arrangements are made for the treatment of such cases in sanatoria situated near their homes.

The educational programme of the Association includes the preparation of a number of lectures on tuberculosis and other health topics, and the distribution of a text-book on personal hygiene and of circulars and pamphlets treating of health matters. Secretaries will be placed in the army camps and will arrange for the delivery of public lectures there from time to time. A number of special tuberculosis exhibits, known as "The Parcel Post Exhibits" will be distributed though the Y.M.C.A. Dr. Pattison, the field secretary of the Association, will visit the training camps and will supervise this educational work.

The Association

THE HAMILTON MEETING

WE have received the following communication from the President-elect, Dr. H. Beaumont Small, on the subject of the annual meeting, and take pleasure in bringing it to the notice of our members.

OTTAWA, *February* 14th, 1918.

To the Members of the Association:

I take advantage of this, the earliest opportunity, to thank the Association for selecting me as President for the ensuing year. To one who has been intimately connected with the Association for so many years, to attain its highest office is an honour that is fully appreciated, and, whilst realizing my many deficiencies, I trust that I may be successful in fulfilling the duties of the office.

I also wish to direct the attention of members to this year's meeting at Hamilton. All should endeavour to add to its success by being present, if possible, and by inducing others to attend. The energy of our Hamilton confrères has gathered for the week so many societies having a common interest, that it may be termed a Medical Congress. This is the first occasion on which such an assemblage has been attempted, and, to maintain the interest of all throughout the week, it has been arranged that there will be a reciprocity of membership which will throw open the meetings of each association to members of all others.

The Local Committee is carefully preparing the programme to prevent any repetition or duplication of subjects. The addresses, discussions, and papers will be of the highest order, which, with the large attendance that must necessarily be present, will make the week one of decided benefit as well as of pleasure.

For this occasion our Association will merge its medical programme with that of the Provincial Association, but the general sessions to transact the regular and necessary business will be held as usual. At these any resolution may be introduced and the affairs of the Association fully discussed.

H. B. SMALL

PRELIMINARY PROGRAMME—COMBINED MEETING

HAMILTON, ONTARIO

Monday, May 27th, to Saturday, June 1st, 1918.

Ontario Medical Association, Canadian Medical Association, Canadian Association for the Prevention of Tuberculosis, Canadian Public Health Association, Ontario Health Officers' Association

Monday and Tuesday

Canadian Public Health Association and Ontario Health Officers' Association

President's address, (Canadian Public Health Association)—"A Plea and a plan"—W. H. Hattie, Halifax.

President's address (Ontario Health Officers' Association)—H. W. Hill, London.

"The public health nurse"—J. A. Baudouin, Lachine.
Paper (title to be announced)—M. M. Seymour, Regina.
"Good public health service in small towns and rural municipalities"—J. J. Harper, Alliston.
"Hints on rural health administration"—J. W. S. McCullough, Toronto.
"The control of an outbreak of diphtheria"—W. C. Allison, Toronto.
"The trail of the medical vampire"—Frederick Paul.
"Health insurance"—Charles J. Hastings, Toronto.
"The venereal disease problem"—Gordon Bates, Toronto.
"Why is it worth while to establish sewerage in a small town?"—F. A. Dallyn, Toronto.
"Interpretation of water analysis"—H. M. Lancaster, Toronto.
"Mental hygiene"—Clarence M. Hincks, Toronto.

Symposium on Child Welfare.

Chairman's address—Alan Brown, Toronto.
"Child welfare in war time"—Isaac Abt, Chicago.
"Progress in child welfare work in Europe"—Grace L. Meigs, Washington.
"The results of three years' work in the department of child hygiene, Toronto"—George Smith, Toronto.

"The medical student in his relation to infant and child welfare work"—Richard Bolt, Cleveland.
"The management of a child welfare week in small cities and towns with results"—Mary Power, Toronto.

Round table discussion and subscription luncheon

Alan Brown, chairman.

Wednesday, 9.00 a.m.

Canadian Association for the Prevention of Tuberculosis

Secretary's report—G. D. Porter, Toronto.
"The role of the health officer in the control of tuberculosis."—H. W. Hill, London.
"Heliotherapy by the Rollier method as applied to surgical tuberculosis with lantern demonstrations"—John H. Pryor, Buffalo.
"President's address"—J. A. Machado, Ottawa.

Ontario Health Officers' Association and Canadian Public Health Association

Social and public health aspects of tuberculosis.

2.15 p.m.

Ontario Medical Association

"President's address"—John P. Morton, Hamilton.

2.30 p.m.

Canadian Association for the Prevention of Tuberculosis:

Symposium on the Diagnosis and Treatment of Tuberculosis:

Differential diagnosis—J. S. Pritchard, Battle Creek.
Sanatorium treatment—A. F. Miller, Kentville.
Artificial pneumothorax—D. C. Parfitt, Gravenhurst.
Tuberculin treatment—J. H. Elliott, Toronto.
8.00 p.m.

Ontario Medical Association, Canadian Public Health Association Canadian Medical Association

General Session:

The returned soldier problem.

Thursday, 9.00 a.m.

Ontario Medical Association and Canadian Medical Association

Meeting of Sections.

2.00 p.m. and 8.00 p.m.

General Session:
Address in Medicine—Lewellys F. Barker, Baltimore.
Address in Surgery—Charles Mayo, Rochester.
Address in Obstetrics—(to be announced).
Address in Pediatrics—I. A. Abt, Chicago.
Address on the Ear—Isaac Jones, Philadelphia.

Friday, 9.00 a.m.

Canadian Medical Association and Ontario Medical Association

Meeting of Sections.

2.00 p.m.

Symposium on Intra-Cranial Pressure:

Medicine—(To be announced)
Surgery—A. E. Garrow, Montreal.
Physiology—J. J. R. Macleod, Cleveland.

8.00 p.m.

General Sessions

Saturday, 9.00 a.m.

Hamilton Clinical Day.

In the section of medicine amongst others the following have consented to take part:—L. Rowntree, Minneapolis; Alan Brown and Geo. E. Smith, Toronto; Beatrice Hinkle and W. Gordon Lyle, New York; J. Chandler Walker, Boston; and Thomas McCrae, Philadelphia. On eye, ear, nose and throat, Casey Wood, Chicago; Walter Parker, Detroit; John Wheeler, New York; Joseph Beck, Chicago; and H. Halsted, Syracuse. In surgery, Dr. McGuire, Buffalo; Dr. Hyman, St. Louis; Dr. Gawthrey, Sayre; and Dr. Henderson, Rochester.

Regarding the work in the sections, the general principle will govern in all that there will be very few papers, but it is the expectation of the Committee that each paper presented will promote a very elaborate discussion so that in a sense each will represent a symposium. The writers of the papers are asked to present a synopsis which should be ready and in the hands of the Committee before March 25th.

It is proposed to have in addition to the regular programme of sections and general sessions, an innovation in the nature of a "Round Table Discussion" on a matter of vital interest to the profession as a whole. This will be arranged for late in the day when the regular programme is finished. Accommodation will be limited and all seats reserved.

A personal conference in Ottawa with Surgeon-General Fotheringham of the Militia Department and others interested in the Returned Soldier Problem, resulted in developing the plans for the Symposium on this subject for Wednesday evening in a very satisfactory manner.

Plans are also under way for the presentation of a most interesting collection of scientific exhibits. There will be a pathological exhibit which will include a very fine collection of museum specimens from the McGill University Museum, and will be in personal charge of Dr. Maude E. Abbott, of Montreal; also an exhibit from the Babies' Hospital, of New York, of a number of specimens illustrating pneumonia in children. It is hoped also to obtain similar exhibits of equal interest from the museums of Queen's Medical College, Kingston; of Toronto University, and the Western University of London. There will be a series of demonstrations of clinical laboratory procedures, including those of special interest to the general profession, such as the Wassermann reaction, the colloidal gold functional kidney test, dark field spirochæta, and the preparation of serums and vaccines for therapeutic use.

For the *x*-ray exhibit, plates are requested to be sent in by men interested in this work. There will be a daily informal demonstration and a lantern will be available for those wishing to use it.

There will be shown daily from four to six, moving pictures on medical and surgical subjects including subjects of interest to the general practitioner.

The American Medical Association have offered the use of their charts, illustrations, and literature, relating to the propaganda for reform as carried on by that Association.

The Local Committee also wish to announce that it is their wish to carry out the programme and all entertainments with greatest respect for war conditions. While there will be no formal receptions or entertainments, this Ambitious City will go the limit of its capacity in its efforts to make the visiting members welcome, comfortable, and satisfied.

RAILWAY RATES

The usual reduced rates have been arranged on all the Canadian roads. These special rates may be obtained by doctors attending the meeting, and by members of their families accompanying them.

In order to take advantage of these rates it will be necessary for the physician when starting, first, to purchase a single first-class ticket (which must cost not less than 50c.) to place of meeting, and second to obtain from his ticket agent a standard certificate properly filled in and signed by the latter. This must be presented to the General Secretary of the Association when registering at the meeting. It will be filled in by him and viséd by a special agent of the transportation companies, who will attend for this purpose and who will collect the sum of 25c. for each certificate examined. The presentation of this form properly filled in and vised will entitle the holder to a return ticket to his home either free of charge or at two thirds, or one third, the regular first-class fare, depending on the number attending the meeting.

From points east of Fort William, Ontario, tickets must be bought between May 23rd and May 29th, inclusive, and the return journey may be made up to and including June 5th, 1918. From points West of Fort William, and Armstrong, Ontario, tickets must be bought between May 22nd and 25th, inclusive; from British Columbia between May 19th and 22nd, inclusive. Certificates for the return journey to the west will be honoured at Hamilton up to and including June 5th. A thirty-days' extension may be secured by the additional payment of one third the full fare from place of meeting to starting point. Stop-overs will be granted holders of these extended tickets.

We would point out to our members that the above special rates apply as well to the boats of the Canada Steamship Lines, as to the railways.

It is hoped that our members will note that it is important to fulfil all conditions mentioned above, and it should be emphasized that the greater the number attending, the less will be the cost of railway transportation.

Obituary

WILLIAM H. JAMIESON

The death of Dr. Jamieson, of Montreal, which occurred at the Royal Victoria Hospital on January 24th, after a brief illness, came as a shock to his many friends. A member of the class of 1893 McGill, Dr. Jamieson soon after graduation decided to take up special work in the ear, nose and throat, and for this purpose went to London and some of the large European centres where he remained for upwards of two years perfecting his knowledge in these branches. On his return to Montreal he was appointed to the staff of the Royal Victoria Hospital and also became a demonstrator of oto-laryngology in McGill University. At the time of his death he had attained the rank of lecturer. He will be greatly missed by a host of friends in university, hospital, and military circles, in each of which he held an important position.

DR. WILLIAM D. YOUNG

A notice of the death of Dr. Young, which occurred on January 4th, was published in our last issue. During a life of earnest self-sacrifice and service, Dr. Young won the love and admiration of those amongst whom he lived and to whom he ministered, and his never-failing response to the cry of pain, be it from rich or poor, and his unswerving devotion to the call of duty have left a memory that the citizens of the Beaches, Toronto, wish to perpetuate. It is thought that the most fitting memorial to Dr. Young would be something that would be an expression of "service", the dominant note of his life, and it is probable that it will take the form of a drinking fountain, which it is proposed to place in Kew Beach Park.

CAPTAIN JOHN F. PALLING, C.A.M.C.

Captain John Ferguson Palling died at the Queen Alexandra Military Hospital, Millbank, England, on January 31st, in his fifty-sixth year. He graduated in 1888 from Trinity College, Toronto, and was in practice at Barrie, Ontario, until February, 1916, when he joined the Canadian Infantry Battalion as medical officer, going overseas the following May.

DR. AUSTIN OGDEN

Dr. Austin Ogden, who recently met his death in France, was the son of the late Mr. H. H. Ogden of Sarnia. Dr. Ogden graduated from the University of Michigan and at the time the war broke out was studying in Germany. He was detained in that country for some time but was subsequently allowed to leave, whereupon he went to England and enlisted in a British regiment. He was killed in action in France.

DR. GEORGE VILLENEUVE

The death of Dr. George Villeneuve, alienist, of Montreal, occurred at Quebec on January 21st. He was a member of the old French-Canadian family of De Lanaudiers and was born at Montreal on February 8th, 1866, was educated at the St. Sulpice College, and graduated in Medicine from Laval University in 1889. Dr. Villeneuve completed his medical studies in London and Paris and upon his return to Canada in 1894 was appointed assistant medical superintendent of the St. Jean de Dieu Asylum at Longue Pointe, Montreal. A few years later he became superintendent of the institution, which he conducted for almost a quarter of a century. In 1905, Dr. Villeneuve married Mademoiselle Jeanne Belleau, niece of Sir N. F. Belleau, K.C.M.G., the first lieutenant-governor of the province of Quebec after Confederation.

Dr. Villeneuve was well known as an alienist and was the author of a work entitled "The Insane and the Law" and other contributions to the literature on this subject. He was a member of the medical faculty of Laval University, Montreal, and a member of the Belgian and American Medico-Psychological Societies. Dr. Villeneuve saw active service during the Riel Rebellion as Captain in the 65th Battalion.

DR. CATELLIER

Dr. Laurent Catellier died at Quebec on January 17th, after a long illness, in the seventy-ninth year of his age. Dr. Catellier was consulting physician to the Quebec Board of Health, professor emeritus and ex-dean of the medical faculty of Laval University, and ex-surgeon of the Hotel Dieu Hospital at Quebec. He was born and educated at Quebec. After graduating with honours from

Laval University, he entered the University of Paris, where he also distinguished himself.

Dr. Catellier acted as the representative of the Quebec Government at the medical congresses of Demey in 1885, of Paris in 1900, and of Habana in 1905. He was closely connected with the Laval University for many years, as student, professor of pathology, and dean of the medical faculty, and his keen interest and sure judgement won the esteem of confrère and pupil.

MAJOR J. H. RATZ, C.A.M.C.

Major Ratz, whose death occurred at Ottawa on February 11th, was assistant medical advisor to the Pensions Board; he was in the forty-ninth year of his age and had been ill for about six months. Major Ratz was born at Elmira, Ontario, in 1869. After attending the Galt High School he entered the University of Toronto, where he received the degree of B.A. in 1892, and his medical degree three years later. He practised in New Dundee, Elmira, and Trenton, and in January, 1915, gave up his practice to join the Canadian Army Medical Corps. He was appointed medical officer of the 34th Infantry Battalion with which he served for a year. He was then appointed to duty at Shorncliffe and West Sandling, and subsequently served on the Canadian Pension Board at Bath, England. On his return to Canada he was attached to the Pension Board at Ottawa as assistant medical advisor.

Dr. Dontagne Desnoyers died at the Sacred Heart Hospital at Sherbrooke, Quebec, on January 15th, at the age of seventy-two years. He was born at St. Jean Baptiste de Rouville and was educated at the St. Hyacinthe Seminary. His medical studies were followed in the United States and after serving for two years as hospital interne in Boston, Dr. Desnoyers returned to Canada and was appointed a member of the medical faculty of Laval University. Dr. Desnoyers, with the Canadian Zouves, took part in the defence of Rome against the troops of Garibaldi and was taken prisoner. Upon being released he returned to Montreal where he continued to practise until about three years ago, when he became ill.

Dr. Arthur Meek, of Southwold, near Stratford, Ontario, died of pneumonia on January 18th, in the sixty-fourth year of his age. Dr. Meek was born at Port Stanley.

Dr. F. S. Snider, sheriff of Norfolk County, died at Simcoe, Ontario, on February 10th. Dr. Snider, who was born near Brandy Creek, Windham, graduated from McGill University in 1876 and practised at Simcoe, Teeterville, and Waterford. He was a member of the county council for four years and in 1898 was appointed warden of Norfolk. In 1902 Dr. Snider was elected to the provincial legislature by the Conservatives. He had been in failing health for two years but had continued his duties as sheriff of the county.

Dr. Arthur Joyal, of Montreal, died of heart failure on February 5th, in the fifty-ninth year of his age. Dr. Joyal was born at Montreal and took his medical degree at Laval University in 1879. For some years he was lecturer in histology at Laval University. He then went to Paris where he studied under Pasteur and Charcot, and upon his return to Montreal devoted himself to chronic diseases of the nervous and digestive systems. He was an indefatigable worker and a keen and earnest student.

Dr. W. H. Hamilton, of Fort William, Ontario, died in Florida at the beginning of February. Dr. Hamilton, who was in the sixty-third year of his age, was born at North Easthope, Ontario.

Dr. William Hall Carleton, of Toronto, died February 14th, in the sixty-fourth year of his age. He was born at Frankfort, Ontario, and graduated from the University of Toronto. Dr. Carleton had been in practice for about thirty-two years and for the past twelve years had been practising in the Thornhill district of Toronto. He had been an invalid for about a year. He is survived by his widow, one son, Dr. G. Wylie Carleton, and one daughter.

Dr. John Newton died at Deseronto on February 13th. Dr. Newton was a graduate of Queen's Medical School and had been in practice at Deseronto for more than forty years.

Miscellany

News

MARITIME PROVINCES

The generous offer of the Board of Governors of Acadia University to accommodate sixty pupils of the Halifax School for the Deaf has been accepted. These pupils will be given accommodation in the hospital building of the university and will have their class rooms in the Rhodes Hall. The directors of the Halifax school have thus been relieved of much anxiety. Since the explosion the students have been at their homes in various parts of the province.

Professor John Weir, assistant superintendent of the Maritime School for the Blind, recently stated that there were in the province of Nova Scotia eight hundred adult blind for whom no provision has been made either as regards accommodation or teaching.

The smallpox situation in the provinces of New Brunswick and Nova Scotia is reported to be much improved. The number of cases is steadily decreasing and it is thought that the danger of further outbreaks is now over. A number of cases of the disease have occurred amongst the families of fishermen at Frog Pond, three miles from Tignish, in Prince Edward Island.

The annual report of the Fredericton Board of Health draws to the attention of the city council the importance of establishing an isolation hospital with as little delay as possible. The danger of an outbreak of smallpox during the past few weeks has made it apparent that such an hospital must be established at once if the public health is to be safeguarded.

In view of the possibility of an outbreak of smallpox in Moncton, a building has been bought by the Board of Health and has been converted into a smallpox hospital. Up to the present, however, only a few cases have been reported in Moncton.

Dr. F. J. Densmore, of Newcastle, New Brunswick, has been appointed chairman of the County Board of Health.

The number of cases of communicable disease reported in St. John, New Brunswick, during the past year was 342 as compared with 404 in 1916, 294 in 1915, and 356 in 1914. The cases included: diphtheria, 76 cases, 2 deaths; scarlet fever, 33 cases, 3 deaths; measles, 30 cases, 4 deaths; tuberculosis, 176 cases, 98 deaths. The number of deaths from tuberculosis is considerably greater than last year, when 63 were reported. The general death rate has steadily decreased during the past few years, the percentages being 17·89, 16·41, and 15·76 respectively for the years 1915, 1916, and 1917; the population of St. John was estimated at 49,930 in June last. The infant mortality in 1917 was 153 per 1,000, a rate which is rather higher than that of 1916, but which is accounted for by the prevalence of cholera infantum in August, September, and part of October. No particular cause for the outbreak could be discovered, but it was noted that the majority of cases occurred in bottle-fed babies.

The tenth annual report of the Harbor View Hospital at Sydney Mines, Nova Scotia, was presented at a meeting of subscribers which took place on January 22nd. During the year 1917, 501 patients were treated in the hospital and 23 deaths occurred. The financial report showed a credit balance of $5,013.48.

ONTARIO

A number of cases of scarlet fever of a mild form have been reported in Ottawa.

It was recently stated by Dr. R. Egerton George, health officer for the district, that in the coal dock district of Fort William, out of one hundred and eighty-eight infants born in 1917, thirty-four died within twelve months.

The following is the list of infectious diseases reported in the province during the month of January: measles, 1,013 cases, 2 deaths; diphtheria, 394 cases, 32 deaths; scarlet fever, 337 cases, 7 deaths; whooping cough, 367 cases, 8 deaths; tuberculosis, 187 cases, 63 deaths; smallpox, 70 cases; typhoid fever, 26 cases, 7 deaths; infantile paralysis, cases, 2 deaths; cerebro-spinal meningitis, 4 cases, 2 deaths. The cases of smallpox, for the most part, occurred in the

counties of Essex, Kent, and Lambton, twenty-six being reported from Sarnia alone.

THE sum of $30,000 has been bequeathed to the Toronto Hospital for Sick Children by the late James I. Carter, of Sarnia.

DURING the past year the following cases of infectious diseases were treated in the Queen Mary Hospital at Peterborough: scarlet fever, 18; diphtheria, 12; measles, 2; spinal meningitis, 1. Cases from outside Peterborough: diphtheria, 6; measles, 1. In future the wards in this hospital will be free to residents of Peterborough The neighbouring townships will be invited to contribute to the maintenance of the hospital and free treatment will be accorded to residents of such as do make such contribution.

DR. DOWNHAM, who has been assistant to the medical officer of health, has been appointed inspector of public health in London.

DR. W. C. WHITE, of Pittsburgh, Pennsylvania, has been appointed chief of the bureau of tuberculosis of the American Red Cross in France. Dr. White graduated from the University of Toronto in 1901.

QUEBEC

SPEAKING at the annual meeting of the Board of Governors of the Western Hospital, Montreal, Mr. D. Lorne McGibbon, who retiring from the office of president was elected honorary president of the hospital, referred to the increasing expenses of the institution. The calamity of a closing of the doors had been averted by public generosity, but such a matter should not be left to the charity of the citizens. It was rightfully the affair of the province and of the city, and if they did not accept their portion of the responsibility now, the time would come when the whole responsibility would be thrown upon them. The report of the secretary showed that 1917 had been one of the hardest years in the existence of the hospital, the cost of maintenance, in spite of the practice of the most rigid economy, having risen from $2.47 a day in 1916 to $3.01 in 1917. Every bed in the hospital had been filled continuously. The treasurer stated that the deficit of $17,436.48 had increased to $40,324.79, chiefly through the increased cost of coal. The medical superintendent reported that 1,388 patients had been admitted to the hospital during the past year, 1,280 being residents of Montreal. Sur-

gical operations had been performed on 737 patients. In the outdoor patient department 19,649 consultations had been given, among them 10,271 surgical cases.

It was reported at the annual meeting of the Board of Governors of the Protestant Hospital for the Insane at Verdun, on Frebruary 7th, that the institution was very much overcrowded, seven hundred and seventy-one patients being at present under treatment, and that it was extremely difficult to procure the services of nurses or attendants. The financial year closed with a deficit of $38,471.

The fifty-second report of the Jeffrey Hale's Hospital, Quebec, was presented to the Board of Governors on February 12th, last. During the past year the James Douglas Tuberculosis Wards have been added to the institution and are now ready for occupation, their purpose being the provision of accommodation for advanced cases of the disease. A central heating plant has also been established and has been working satisfactorily during the winter. In accordance with the request of the military authorities thirty beds in the hospital have been devoted to military patients.

During the past twelve months nine hundred and one patients have received treatment in the hospital, the total number of hospital days being 17,127.

Dr. J. T. Wall, of Montreal, has been elected a member of the Royal College of Surgeons.

Several cases of smallpox were reported in Joliette during January. Prompt measures, however, were taken to prevent the further spread of the disease, and the total number of cases reported in the district was about twenty-five.

The Laval Hospital which is being built at Quebec for the treatment of cases of tuberculosis will probably be opened about May 1st. The hospital will be used as a clinic for teaching purposes by the medical faculty of Laval University and will be in charge of the Grey Nuns. Sufficient accommodation will be provided for one hundred and thirty-five persons and the treatment will be given free of charge. The hospital is built on a site overlooking the St. Charles Valley with the Laurentide Hills in the distance. Grants of

$25,000 were made by the provincial government and also by the city of Quebec towards the establishment of the hospital, the remainder being contributed by private subscription.

MANITOBA

An additional grant of $58,600 has been made to the hospital board by the Winnipeg Board of Control to cover the deficits shown in last year's annual statement of the King George and King Edward Hospitals.

SASKATCHEWAN

The new hospital at Eston was officially opened by Dr. Seymour, commissioner of public health, on January 15th, last.

A dinner was given on February 1st by the physicians of Saskatoon in honour of Lieutenant-Colonel Andrew Croll, C.A. M.C., on the eve of his return to the front after a short leave of absence.

The free distribution of diphtheritic anti-toxin in the province was commenced by the government last September. From then to the end of January, 1918, the following amounts have been distributed: September, cities, 2,303,000 units; rest of province, 2,707,000 units; October, cities, 1,466,000 units; rest of province, 855,000 units; November, cities, 3,594,000 units; rest of province, 1,313,000 units; December, cities, 2,616,000 units; rest of province, 1,594,000 units; January, cities, 4,776,000 units; rest of province, 2,723,000 units; total, 23,947,000 units.

Resolutions have been passed recently by the Trades and Labour Council and the Northside Ratepayers' Association of Regina in favour of the establishment of a free hospital in Regina.

The following is the list of communicable diseases reported to the Provincial Bureau of Health during the month of December: diphtheria, 103 cases as compared with 31 cases in the same month in 1916; chicken-pox, 109 cases as compared with 83 last year; mumps, 39 cases; whooping cough, 16 cases; typhoid fever, 12 cases, as compared with 4 during the previous December; measles, 18 cases as compared with 35; cerebro-spinal meningitis, 2 cases; tuberculosis, 5 cases; smallpox, 1 case; scarlet fever, 11 cases as compared with 48 in December, 1916.

During the past year municipal hospitals have been established at Lloydminster, Edam, Eston, and Shaunavon; the one at Shaunavon, however, is not yet completed. The necessary by-laws have also been passed at Davidson, Rosetown, Kerrobert, and Lampman, and arrangements are being made for the establishment of municipal hospitals at these places. By-laws for the establishment of similar hospitals were submitted to the municipalities in the Estevan, Outlook and Lanigan districts but were defeated.

ALBERTA

The building that was formerly used as the Red Deer College and was bought some months ago by the provincial government for the purpose of a home for mentally defective children, has been taken over temporarily for the accommodation of soldiers who have been mentally affected by the war. When the necessary alterations have been made to the building there will be room for about one hundred and fifty patients. At present there are about thirty soldiers in the asylum at Ponoka, which is much overcrowded; it is the intention to remove these patients to Red Deer and it is thought that their chance of recovery will be greater there than at Ponoka. The Ponoka institution is also to be enlarged.

It has been suggested that the military sanatorium which it is proposed to establish should be built at Kananaskis, about twenty miles east of Banff, in the foothills of the Rockies, but its inaccessibility would constitute a serious objection. The estimated cost of the institution is $400,000, half of which will be paid by the Dominion Government and the remainder by the Province. It will be built on the unit plan and will accommodate three hundred patients, and when no longer required for the treatment of soldiers will become the property of the province of Alberta for the treatment of civilian patients.

A meeting of the Calgary Hospital was held on January 16th, when it was decided to increase the fees charged to patients from outside the city to $1.50 a day; it was pointed out that the actual daily cost of maintenance last year averaged $1.95 for each patient, and that this year it would in all probability be $2.00 or more. It was also decided that patients in the general wards of the Mount View Sanatorium should be given treatment free of charge in future. The question of providing free accommodation to school children was

brought up by a deputation from the school board, and Mr. Ross, speaking on their behalf, stated that whereas three hundred and thirty-eight cases were treated last year in the school clinic, only twenty-two of them were admitted to the General Hospital. He considered that, as the General Hospital was a municipal institution, such cases should be given accommodation in preference to patients from out of the city. After some discussion it was decided that a flat rate of from $2.50 to $3.00 a day, which would cover the actual cost of the service, should be granted and should be chargeable to all patients whose parents could afford to pay. Another point that was discussed was the necessity for a provincial home for incurables and it was decided to appoint a commitee to consider the matter. Dr. Fisher, superintendent of hospitals, stated that there were a number of cases of chronic illness in the province for which proper accommodation ought to be provided and that at that time there were eight in the General Hospital.

The following is the text of a resolution passed by the Mount View Hospital Auxiliary, Calgary: "We, the Tuberculosis Hospital Auxiliary, are in hearty sympathy with the action taken by the hospital board in eliminating the fee from the public ward in the Mount View Hospital. The work of the auxiliary keeps in touch with the victims of tuberculosis, and also sufferers from straightened circumstances. The auxiliary finds that an important factor in effecting a cure is to relieve the patient's mind from financial worries. The auxiliary will urge the Calgary Hospital board to work towards the elimination of all hospital fees, believing that free medical attention and free hospital treatment, and also free use of the appliances, would do much to check diseases and to raise the standard of health."

BRITISH COLUMBIA

In an address before the Vancouver Board of Trade, Dr. MacEachern, medical superintendent of the Vancouver General Hospital, stated that whereas in 1906 the number of patients treated in the hospital was about fifty a day, the average number of cases now under treatment is eight hundred, and that over five thousand meals were served in the hospital every day. The death rate, thirty-six per thousand, was as low as that of any hospital in the Dominion.

MEDICAL COLLEGES

Toronto University

Major L. Bruce Robertson, C.A.M.C., who has been on active service since the beginning of the war, has been recalled by the University. Major Robertson has been attached to the staff of No. 2 Canadian Casualty Clearing Station.

The continuance of the war has made it necessary to postpone the inauguration of the proposed six-year course in medicine until one year after peace has been declared.

Queen's University

Announcement is made by the medical faculty of Queen's University that no negro students will be admitted to the study of medicine at that university in future. It has been found impracticable to give such students the necessary clinical instruction. Arrangements will be made for the transfer to other schools of the fourteen students at present in the faculty.

Western University

The Western University Hospital Unit (No. 10 Canadian General Hospital) is now stationed "somewhere in France". The unit left England on December 24th under the command of Lieutenant-Colonel Seaborn, and Christmas Day was therefore the first day spent in France.

In view of the serious strain imposed on the profession by the war, the Board of Governors of the University have decided to admit women to the study of medicine in future.

ARMY MEDICAL SERVICE

The following members of the Canadian medical services have been brought to the notice of the Secretary of State for War for valuable services rendered:

Brigadier-General E. C. Ashton, C.M.G., of Brantford, who went overseas as O.C. of the 36th Battalion. He was subsequently appointed Colonel in the Reserve Infantry Brigade, Divisional Commander at Shorncliffe, and Commanding Officer and Brigadier-

General of the Fifth Division, Canadians. General Ashton is now Acting Adjutant-General at Ottawa.

Colonels Kenneth Cameron, C.M.G., and F. G. Finley, C.M.G., of Montreal; Colonel G. S. Rennie, C.M.G., of Hamilton, A.D.M.S. of the Shorncliffe area.

Colonel Wallace A. Scott, C.M.G., who is a member of the medical staff of Toronto University. Colonel Scott went overseas with No. 2 Canadian General Hospital and is at present Officer in Command of the Moore Barracks Hospital in England.

Colonel W. L. Watt, C.M.G., of Winnipeg.

The Military Cross has been awarded to the following:

Captain Austin Irvine, C.A.M.C., of Montreal. Captain Irvine went overseas as medical officer of the Grenadier Guards. At the request of the French Government, he was transferred to duty at a base hospital near Paris. Captain Irvine is a graduate of McGill University and was on the staff of the Western Hospital, Montreal.

Captain George C. Anglin, C.A.M.C., of Toronto, who has been on active service for three years.

Captain Henry Clarke Davis, C.A.M.C.

Captain James F. Stewart Marshall, C.A.M.C.

Captain Thomas Williamson Moore, C.A.M.C.

Captain J. MacNeill, C.A.M.C.

Captain Henry Frederick Preston, C.A.M.C.

Captain Ernest C. Whitehouse, C.A.M.C.

The bar to the Military Medal has been awarded to Sergeant C. Speller, R.A.M.C., of Nutana.

The Distinguished Conduct Medal has been awarded to Sergeant E. Bickby, C.A.M.C., who attended to the wounded continuously for thirty-six hours.

Dr. D. A. Craig, medical superintendent of the Byron Sanatorium at London, Ontario, has been appointed military expert in tuberculosis by the Department of Militia, with headquarters at London, Ontario.

No. 1 Canadian Stationary Hospital recently returned from Salonica, has been posted to Hastings and is now designated No. 13 Canadian General Hospital. Lieutenant-Colonel E. J.

Williams, D.S.O., is commanding officer with Major J. Guy Johnson, of Montreal, in command. Major W. Hutchinson, of Montreal, is attached to the Surgical Division and is in charge of the Special Section.

Lieutenant-Colonel A. J. Mackenzie, C.A.M.C., of Toronto, is in charge of the medical department of the Granville Special Canadian Hospital at Buxton, England.

Colonel D. G. Farmer, C.A.M.C., of Wentworth, Ontario, has been appointed Officer Commanding the Canadian General Hospital at Liverpool, England.

Captain C. G. Cox, of Regina, is the medical officer of the 77th depot battery.

Captain Gregoire Longault, of Regina, is the medical officer of the 22nd Cavalry Ambulance.

Captain A. C. Armstrong, M.C., C.A.M.C., medical officer of the Ross Military Hospital at Regina, has been elected a Fellow of the Royal Institute of Public Health of London. Both the Military Cross and the *Croix de Guerre* have been conferred upon Captain Armstrong for services at the front.

Dr. Earl Smith, of Woodstock, Ontario, has joined the 13th Field Ambulance.

The Military Hospitals Commission has purchased the National Cash Register Company's factory in Toronto with the intention of converting it into a convalescent hospital. The buildings as at present constituted are capable of providing accommodation for about four hundred patients, and plans are in course of preparation for the addition of two storeys which will increase this accommodation to between eight and nine hundred beds.

The following have been promoted to be temporary Captains in the Canadian Army Medical Corps: Temporary Lieutenants E. McK. Shorley, E. W. Nolan, E. C. Mick, R. K. Johnston, D. R. Fletcher, G. F. Denyes, N. D. Black, J. P. Bonfield, W. C. Page, F. A. O'Reilly, C. B. Corbett, J. E. Fraser, W. W. McKay, F. L.

Reid, E. J. Gordon, W. G. Robertson, B. Lyon, C. M. Sellery, G. L. Sills, J. R. Patterson, B. W. Cannon, H. R. Nicklin, G. S. Purvis, J. M. Clark, G. K. Shirton, J. S. Sutherland, E. H. Whelpley, F. C. Wilson, P. J. O'Dwyer, M. MacKay, T. H. Williams, T. D. Wheeler, C. W. Burns, C. W. Torrance, A. M. Jeffrey, W. E. Brown, H. A. Elliot, H. A. Mitchell, F. G. Banting, G. M. Dobbin, J. S. Douglas, C. D. Farquharson, D. G. Findlay, C. E. Frain, A. R. Hagerman, C. V. Mills, C. S. Macdougall, R. MacKinlay, A. Montgomery, G. R. Scott, W. E. L. Sparks, F. McN. Johnson, W. W. Barraclough, T. W. Bleakley, R. M. Harvie, N. O. Thomas, F. S. Parney, J. F. Adams, H. C. McAllister, W. G. Jamieson, E. D. Hutchinson, D. I. Davis, T. E. White, M. G. Graham, A. MacKay, F. W. W. Hipwell, G. D. Jeffs, D. St.-C. Campbell, J. D. G. Campbell, J. A. Davies, D. W. N. Gwicker, W. M. MacDonald, K. G. Mahabir.

CASUALTIES

Killed in Action

Dr. Austin Ogden, of Sarnia, Ontario. (Dr. Ogden was in the combatant forces.)

Died on Service

Captain John F. Palling, C.A.M.C., of Barrie, Ontario.

Wounded

Captain H. A. Cochrane, C.A.M.C.

Canadian Literature

Original Contributions

Canadian Practitioner and Review, January, 1918:

Recent advances in the operative treatment of certain intracranial conditions and especially brain injuries . . . . W. Sharpe.

Dominion Medical Monthly, January, 1918:

The treatment of leukorrhea with lactic acid bacilli . . . . F. B. Block and T. H. Llewellyn.

The Public Health Journal, January, 1918:

Notes on the housing problem in England with some lessons for Canada	F. A. Dallyn.
Pasteurization of milk supply	J. A. Baudouin.
Control of venereal disease	E. H. Marsh.

Le Bulletin Médical, January, 1918:

Pneumonie infantile	Jobin.
Traitement de la furanculose et de l'acné par les autovaccins antistaphylococciques	A. Vallée and R. Potvin.
Inspection médicale des écoles	T. Savary.
Quelques observations sur le traitement de épididymite blennorrhagique par le Dmegon	Dr. Dubois.
Essais de vaccinothérapie anti-gonococcique à l'aide du vaccine Nicolle-Blaizot	L. Moreau.

Book Reviews

THE FUNDUS OCULI OF BIRDS, ESPECIALLY AS VIEWED BY THE OPHTHALMOSCOPE: A STUDY IN COMPARATIVE ANATOMY AND PHYSIOLOGY. By CASEY ALBERT WOOD. Illustrated by 145 drawings in the text; also sixty-one coloured paintings, prepared for this work by Arthur W. Head, F.Z.S. Chicago: The Lakeside Press, 1917.

In reviewing this handsome folio, one is impressed at the outset by the fact that its purely mechanical features have been made to conform to the exacting ideals of the author, who, famous as a book-lover and producer of books, possesses as an ophthalmologist an exact knowledge of the physiological requirements of the eye. Throughout the volume spaced lines of sharply-defined type are perfectly impressed upon dulled sheets of straw paper. A sense of pure physical enjoyment is imparted by the excellence of the book in this respect. The numerous line drawings are as satisfactory as the type, and the coloured paintings will rank among the finest

ophthalmological illustrations. A commendable feature is the convenient juxtaposition of the pictures to the accompanying descriptions. Typographical errors are few and unimportant, and the binding is good.

The main purpose of the study, in the words of the author, is to furnish such a description of the intraocular appearances and the methods employed in viewing them as will enable other ophthalmologists and zoologists to further this study by examining the eye-grounds of birds that come under their observation.

To this end, the author gives in detail methods of collecting, selecting, and preparing material; reviews the anatomy and physiology of the organs and tissues seen in the fundus oculi of the bird; and describes the ophthalmoscope and its use, especially in the examination of birds. Then follows a detailed description of the ophthalmoscopic and macroscopic appearance of the fundus oculi of some representative of practically all the orders of birds, embodying wide studies of many years' duration. Other chapters are devoted to the classification of the ocular fundi of birds; the ocular fundus of birds in its relation to a classification of Aves; and the relation of reptilian to avian fundi. Finally, sixty-six splendid coloured illustrations, prepared for the author by Mr. Arthur W. Head, F.Z.S., already well known for similar work in connexion with the eyes of animals, complete the volume.

Most important among Dr. Wood's conclusions, which are conveniently placed at the beginning of the book, is the statement that, because the appearances in the fundi of birds are so constantly characteristic, it is frequently possible to recognize a given species by the ophthalmoscope alone. This means valuable additional aid in what is often a very difficult field.

Only those who know from personal experience the labour involved in obtaining an intimate knowledge of our bird neighbours, and in particular the unfailing patience required in the opthalmoscopic examination of wild creatures, can fully appreciate the magnitude of the task accomplished. Dr. Wood is to be heartily congratulated on this splendid investigation in what is practically a virgin field of pure science.

Books Received

THE following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

GREEN'S MANUAL OF PATHOLOGY AND MORBID ANATOMY. Twelfth edition, 590 pages, revised and enlarged by W. CECIL BOSANQUET, M.A, M.D., F.R.C.P., assistant physician to Charing Cross Hospital and to the Brompton Hospital for Consumption and Diseases of the Chest, and W. W. C. TOPLEY, M.B., B.C. (CANTAB.), M.R.C.P., bacteriologist and clinical pathologist to Charing Cross Hospital. University series. Price 18/- net. Publishers: Baillière, Tindall & Cox, 8 Henrietta Street, Covent Garden, London, 1918.

MANUAL OF MEDICINE. By THOMAS KIRKPATRICK MONRO, M.A., M.D., fellow of the Royal Faculty of Physicians and Surgeons, Glasgow. Fourth edition, 1019 pages. University series. Price 18/- net. Publishers: Baillière, Tindall & Cox, 8 Henrietta Street, Covent Garden, London, 1918.

AN INTERNATIONAL SYSTEM OF OPHTHALMIC PRACTICE. Edited by WALTER P. LYLE, A.M., M.D. MEDICAL OPHTHALMOLOGY. By ARNOLD KNAPP, M.D., professor of opthalmology, Columbia University. 480 pages, with 32 illustrations. Price $4.00 net. Publishers: P. Blakiston's Son & Co., 1012 Walnut Street, Philadelphia, 1918.

BLOOD TRANSFUSION HÆMORRHAGE AND THE ANÆMIAS. By BERTRAM M. BERNHEIM, A. B., M.D., F.A.C.G., instructor in clinical surgery, The Johns Hopkins University. 247 pages. Price $4.00. Publishers: J. B. Lippincott Company, Philadelphia, London, and Montreal, 1917.

A HISTORY OF NO. 7 (QUEEN'S) CANADIAN GENERAL HOSPITAL, March 26th, 1915—November 15th, 1917. This book is dedicated to JAMES DOUGLAS, LL.D., chancellor of Queen's University.

THE VENEREAL DISEASE PROBLEM. A Book More Especially for Nurses and Midwives. By J. K. WATSON, M.D., author of "A Handbook for Nurses", etc. Price 2/6 net. Publishers: Baillière, Tindall & Cox, 8 Henrietta Street, Covent Garden, London, 1917.

MEMORANDA ON ARMY GENERAL HOSPITAL ADMINISTRATION. By Various Authors. Edited by P. MITCHELL, M.D., Lieutenant-Colonel R.A.M.C., officer commanding No. 43 General Hospital. Price 5/– net. Publishers Baillière, Tindall & Cox, 8 Henrietta Street, Covent Garden, London, 1917.

DISEASES OF THE SKIN THEIR PATHOLOGY AND TREATMENT. By MILTON B. HARTZELL, A.M., M.D., LL.D., professor of dermatology in the University of Pennsylvania. 725 pages with 21 coloured plates and 242 cuts. Price $7.00. Publishers: J. B. Lippincott Company, Philadelphia, London, and Montreal, 1917.

THE PRACTICAL MEDICINE SERIES. Comprising ten volumes of the Year's Progress in Medicine and Surgery. Under the general editorial charge of CHARLES L. MIX, A.M., M.D., professor of physical diagnosis in the Northwestern University Medical School. VOLUME VII, OBSTETRICS. Edited by JOSEPH B. DE LEE, A.M., M.D., professor of obstetrics Northwestern University Medical School, and others. Price $1.25. VOLUME VIII, PHARMACOLOGY AND THERAPEUTICS. Edited by BERNARD FANTUS, M.S., M.D., associate professor of medicine, Rush Medical College, Chicago. PREVENTIVE MEDICINE. Edited by A. A. EVANS, M.S., LL.D., P.H.D., professor of preventive medicine Northwestern University Medical School. Series 1917. Price $1.50. Chicago: The Year Book Publishers, 608 South Dearborn Street.

Medical Societies

MONTREAL MEDICO-CHIRURGICAL SOCIETY

THE fourth regular meeting of the Society was held on Friday November 16th, 1917, Dr. A. E. Garrow, president, in the chair.

PATHOLOGICAL SPECIMENS: Series by Dr. Maude E. Abbott, who remarked as follows:

The specimens I am about to demonstrate were presented to the McGill Medical Museum by a recent graduate, Dr. Alton Goldbloom, now of the Boston Floating Hospital, to whose initiative and enthusiasm we are much indebted for a most valuable collection, unsurpassed both in brilliancy of colour preservation and in pathological interest. The collection consists of the intestines from a series of cases of acute enteritis in children, and also the lungs from two cases of exceptional interest of pulmonary disease in infants.

The microscopic appearances in these two last named specimens, which I now show on the epidiascope, form an interesting comparative study of the histological changes in syphilis and tuberculosis respectively. In the syphilitic slide the inflammatory reaction is of a markedly productive character with the formation of a vascularized granulation tissue which progresses from the blood vessels, very rich in plasma cells and other polynuclear elements, with few giant cells and relatively little caseation. In the tuberculous lung, on the other hand, we see an acute necrosing process, large caseating areas destitute of blood vessels containing both epitheloid and giant cells, and surrounded by a zone of lymphocytic invasion and a deeply congested periphery. Spirochætes are seen stained by the Levaditi method in the syphilitic lung and no tubercle bacilli, but the latter are present in great numbers in the slide of caseous pneumonia, stained by carbol-fuchsin.

The series of acute enteritis is of interest, both in the types of disease represented, which include acute catarrhal, ulcerative and membranous forms, and also from the clinical standpoint in regard to the development of acidosis, which Dr. Goldbloom tells me is being investigated there in all cases of infantile diarrhœa by the estimation of the CO_2 tension of the alveolar air and the alkaline reserve of the plasma by the Mariott apparatus. He writes: "The study of the respiratory changes in diarrhœal cases is most fascinating. There are two types, it seems, of acidosis; one which is caused by the ketone bodies, the result of the starvation and the inability of the inflamed bowel to utilize carbohydrate,—this is seen mainly in the so-called infection cases. CO_2 in these cases may be quite low, but seldom below 22 or 25 mm. There is another condition, however, not infectious but fermental, characterized by a profuse watery diarrhœa with marked dessication, where much more severe grades of acidosis are seen, with CO_2 tension as low as 15 or 20 mm., needing soda intravenously, and often very fatal.

This is frankly not due to ketone bodies formation, for they will be found in the urine only in very small amounts, and there will be no acetone odour to the breath. This type of acidosis is due to the fact that owing to an excessive loss of fluid by the bowel, the kidneys attempt to conserve this by diminished excretion with the result that the acid products of metabolism are retained. It is more severe and more deadly in our experience than the other type. Frequently the diarrhœal condition becomes a secondary consideration for the time being, the necessity of neutralizing the diminished alkalinity of the blood being so very urgent. We have therefore found the estimation of the CO_2 tension of inestimable value, and easily and quickly carried out at the bedside even on the youngest infant."

The exact details of the seven specimens, which are mounted and put on exhibition by Mr. Judah here, are as follows:

1. *Congenital syphilis of lungs of infant with multiple gummata and so-called white (syphilitic) pneumonia. Spirochætes in tissues by Levaditi method. Tubercle bacilli absent.*

The right lung is somewhat larger than the left and is diffusely mottled with dark red areas scattered over a surface of paler fleshy tint, the whole diffusely consolidated except in a small portion along its upper border, which is airless. Its central part is occupied by one large and several smaller caseous gummata, the largest of which presents a central cavity surrounded by a thick caseating wall and extends from the upper into the middle lobe through the pleural surfaces of the two lobes which are firmly adherent to each other at this point by extension of the gummatous inflammatory tissues.

The left lung presents one large gumma with central cavitation in its upper lobe and is air-containing in about two-thirds of its extent. Its lower lobe is of a fleshy feel and pale pinkish colour and is quite airless and solid, presenting the gross appearance of the young granulation tissue characteristic of syphilitic pneumonia.

From a male infant aged six weeks, a typical congenital luetic with snuffles, fissures about the anus, pinched finger nails. Shotty adenopathy, palable spleen and liver 3 cm. below the intercostal border, superficial ulcers in buttocks. Full term. Breast fed. Clear history of luetic infection in father thirteen years previously. Admitted to hospital with diarrhœa and complaint of failure to gain weight and grow. The infant never coughed, probably owing to extreme weakness, and physical examination of chest was negative, so that no pulmonary lesion was suspected. Failed to rally

and wasted away in a week. Wassermann reaction was positive and von Pirquet negative.

Microscopical examination showed the lung largely obliterated by a cellular granulation tissue, rich in plasma cells and other polyblasts, partly vascularized, interchanging with areas of fibroplastic and mature fibrous tissue, especially well developed around and progressing from blood vessels. Small tubercle-like, mostly fibroid, nodules are also numerous. Caseation is generally absent, although tendency to necrosis and some actual necrosis of tissue is to be noted. In earlier places distinct cellular fibrous interalveolar thickening occurs. The whole sufficiently characteristic of the syphilitic process to enable the diagnosis to be made. (Entry No. 6062.)

2. *Acute disseminated caseous tuberculosis of lungs of infant with acute tuberculous pleurisy and extensive caseation in mediastinal and peribronchial lymphatic glands, and extension through lymphatics to pleura and outer surface of pericardium. Anomalous lobulation.*

Both lungs with the trachea, bronchi, pericardial sac, and mediastinal glands attached, carefully dissected to show the mediastinal structures. The heart has been removed and the interior of the pericardial sac exposed. The left lung has but one lobe and the right a very rudimentary division.

A large mass of densely caseating and enlarged glands, most of which are discrete from each other, are grouped about the arch of the aorta just above the pericardium and encircling the anterior surface and right side of the trachea and its bifurcation. Seen from the front these glands form a continuous chain of coronal shape running from the root of the right to that of the left lung, being larger and more numerous on the left side where the outer surface of the pericardium is seen to be involved, and a series of delicate lymphatics run from the lower glands of the chain to the pleural surface over the hilum of the lungs. The pleura in this neighbourhood and also over the diaphragmatic surface and over the whole right lung is the seat of an extensive yellowish exudate and numerous caseating tubercles. The posterior aspect of the specimen shows the mass of caseating glands seen from the front dipping down at the back of the hilum of the right lung, and a portion of the right parietal pleura completely covered with a tuberculous inflammatory exudate. The apex of this lung is transformed into a dense caseous mass the size of a walnut and there is extension downwards of the process by lobular foci of caseous broncho-pneumonia and an acute fibrinous pleurisy.

From a male infant aged fifteen months. History of failure to gain and loss of weight for past seven months. Cough during past three or four months, loss of appetite and listless. Dulness in right interscapular region and breath sounds increased over this area and inconstant fine crackling râles heard. Lumbar puncture showed increased pressure, 150 cells and tubercle bacilli. Cerebro-spinal signs came on after the child had been ten days in hospital.

The post-mortem showed the lungs as above, also tuberculous meningitis, miliary tuberculosis of liver and spleen and kidney, but none of mesenteric lymph nodes or peritoneum. Horseshoe kidney. Both lungs were left attached to the mediastinum in order to show the relationship of tuberculous peritoneal lymph nodes to the main tuberculous process. Note the advanced lesion at the apex of the right lung which was noted as somewhat unusual in a child of this age. (Entry No. 6262.)

3. *Horseshoe kidney and spleen of anomalous shape, the seat of acute miliary tuberculosis.* (From the preceding case.)

4. *Small intestine. Death from acute intestinal indigestion of infancy, with acute intoxication.*

A piece of jejunum showing marked injection of follicles which project from the mucosa as bright red areas.

From an exclusively breast fed infant with an acute attack of diarrhœa, no pus or blood. No vomiting. Physician's examination negative. Diarrhœa very watery. Child did not rally. Diagnosis—acute intestinal indigestion. Parenchymatous degeneration of kidneys; fatty infiltration of liver. (Entry No. 6261.)

5. *Acute ulcerative ileo-colitis of infancy.* (Infectious diarrhœa, bacillary dysentry.)

The colon, appendix, and portion of ileum, showing œdematous mucous membrane, intense injection of mucosa with pin-point areas of denuded endothelium diffusely scattered through large and small intestine. Ulcers are not of follicular type, but are rather irregular areas where the endothelium has been eroded. Some appear as chinks and streaks or triangular cuts in the mucosa, others as shallow punched-out, pin-head sized cavities. No pseudo membrane has been formed.

From a female infant aged nine months. Onset one week before admission, diarrhœa with pus and blood, eight to nine movements per day. Prostrated. Markedly dessicated. Survived about one week after admission. Extremely toxic. Had a great deal of tenesmus. No clinical evidence of acidosis. Parenchymatous degeneration of kidneys. (Entry No. 6263.)

6. *Acute ulcerative ileo-colitis in infancy.*

A small piece of jejunun from the preceding case about four feet above the ileo-cæcal valve to show the abrupt commencement of the dysenteric lesion, which was continous from that point down to the rectum as shown in specimen No. 5. (Entry No. 6263.)

7. *Acute membranous ileo-colitis of infancy* (probably the most fatal form of infantile diarrhœa known).

A portion of ileum, cæcum, colon and a piece of sigmoid from a young child; mounted in three strips.

The whole of the large bowel and the greater portion of the ileum shows an active inflammatory process with congestion and thickening in the mucosa, which is the seat of the patchy adherent membrane. These changes are most marked in the cæcum and lower part of colon and sigmoid. The ileum for about 12 cm. above the ileo-cæcal valve is relatively free from disease, the area in its immediate neighbourhood is intensely involved.

History of severe diarrhœa six days. Pus and blood in stools. CO_2 tension alveolar air 30 mm., white blood cells, 20,000. Convulsions on admission which continued intermittently until death. Spinal tap negative. Stools between eight and thirteen per day with blood and pus.

At post mortem the process was seen to be most marked in the large bowel which was œdematous with patches of active congestion and was throughout the seat of a putrid inflammation, covered with pus and lymph exudate. Parenchymatous degeneration of kidneys and fatty infiltration of liver. (Entry No. 6259.)

Discussion: Dr. F. M. Fry: I am sure we all wish to thank Dr. Abbott and Dr. Goldbloom for giving us such a wonderfully clear exhibition of diseases in infants. I do not see that any discussion is necessary but I would like to express our gratification and thanks for the privilege of seeing such an excellent series.

Demonstration: by Dr. A. Bramley-Moore of the different charts used by the military authorities in various countries for the eyesight tests for military service. Dr. Bramley-Moore explained the various charts used together with the standards required for the different units of the army.

Paper: The paper of the evening was given by Dr. R. H. Craig on, "A brief reference to the static labyrinth and its importance to aviators," illustrated by charts and diagrams.

Discussion: Dr. D. H. Ballon: I congratulate Dr. Craig on his most interesting paper. This is a subject that has interested me very much and I read a paper on these tests at the annual meeting of the Canadian Medical Association in St. John, N.B.,

in July, 1914. The man who had done more than any other on this subject is Barany who has been awarded the Nobel Prize for his researches. Dr. Craig in his paper presents a subject of tremendous possibilities. I would like to mention that Menière was the man who discovered that the semicircular canals had to do with dizziness, it was about 1870, in a case of hæmorrhage of the labyrinth that died, corroborated by post mortem examination. Barany is the man who put this whole subject on a practical basis. In 1905 it was he who discovered the caloric reaction, which is the most delicate test we have for the examination of the labyrinth and the cerebellum. You do not always require a turning chair, it is only in doubtful cases that you ought to supplement the caloric reaction by the chair. In five minutes you get all the reactions for the inner ear and the cerebellum with the caloric reaction. Say for instance, the right ear is syringed with cold water, every person with a normal labyrinth will have a rotary nystagmus away from the syringed ear and the pointing test is opposite to the nystagmus. The pointing test, which was also discovered by Barany in 1909, is for the examination of the cerebellum.

Dr. Bramley-Moore: In connexion with the examination of possible aviators here, I may say that it is merely superficial, the final examination is carried on in Toronto. Here the tests are only just preliminary ones, the whispering voice at twenty feet, colour vision, urine and blood pressure. All the finer examinations are made in Toronto.

Dr. R. A. Kerry: The history of the development of these extraordinary organs, the functions of which Dr. Craig has so instructively discussed, is of unusual interest, furnishing as it does one of the best examples of adaptation of a primitive sense to special purposes. Creatures at about the same stage of development as amœba, are endowed with what Bounier terms a baresthesic sense, that is, they can distinguish changes of pressure, usually more or less periodic, in the medium in which they live. This power, which may be termed a sense of "touch at a distance", enables the animal to get its food, to detect the presence of an enemy, and to some extent to determine its position relative to its surroundings. At a higher stage of evolution papillæ of neuro-epithelium are found on the surface which are specially sensitive to changes in pressure, and a little higher still we find the papillæ withdrawn into pits on the skin, the effects of this modification being to deny expansion to the pressure waves after they have entered the pits and so intensify their action on the papillæ. In the medusæ a most extraordinary development takes place. Some of the tentacles

on the border of the disc, lose their elasticity, bend across the epithelial pits, become calcified and form what are really primitive otoliths, suspended in contact with the papillæ. The effect of this change is to convert molecular into molar vibration; taking the formula "half the mass multiplied by the square of the velocity" as representing the work done, a comparison of the mass of even so small a body as an otolith with that of a molecule of water, gives some idea of the tremendous amplification of the stimulus.

Among the reptilia the perception of rapid changes of pressure or vibration, so highly developed in the insecta, begins to take the form of hearing and is accompanied by the formation of rudimentary cochlea, the sense of hearing being added to the more basic labyrinthine functions which still persist, both the primitive and secondary functions being brought to a greater degree of perfection in the higher orders. It is interesting to observe that hearing, as we know it, is but a development of the primitive sense of "touch at a distance" with the impulse arousing it still communicated to the nerve by an aqueous medium, and that the functions of both labyrinth and coclea depend upon changes in pressure.

The aurists have with painstaking accuracy established the effects of various labyrinthine stimuli on the movements of the eyes. Complementary work on the part of the oculist has not been fruitful. No good reason is forthcoming why a patient with failing accommodation should, in one case, have vertigo, nausea, and a host of distant symptoms, and in another none. A patient came to my office a few days ago with a condition supposed to be due to labyrinthine or cerebellar trouble. A tentative diagnosis made at the time of accommodative asthenia, seems justified by the course, but the reason why such symptoms should supervene must *faute de mieux* be set down to individuality.

Dr. R. H. Craig: In reply to Dr. Kerry I have endeavoured to show that Kubo's experiments upon sharks, and the work of Makenzie and any other scientific observers have proved to us that the saccules and utricles are concerned with our progressive movements while the semicircular govern our turning movements.

With reference to Dr. Lauterman's enquiry, a birdman must be able to pass all the military tests plus the ear balance tests which have been carefully worked out by Barany.

In answer to Dr. Ballon, I would say that no one man is altogether responsible for the consummation of this work; it has taken almost a hundred years to develop it, and many men have contributed to the results which were finally successfully worked out in practical form by Barany.

Medical Societies

CANADIAN MEDICAL ASSOCIATION:—President—Dr. A. D. Blackader, Montreal. President-elect—Dr. H. B. Small, Ottawa. Acting Secretary treasurer—Dr. J. W. Scane, 836 University Street, Montreal.

ACADEMY OF MEDICINE, TORONTO:—President—Dr. D. J. Gibb Wishart. Secretary—Dr. J. H. Elliot, 11 Spadina Road. Treasurer—Dr. J. H. McConnell.

ALBERTA MEDICAL ASSOCIATION:—President—Dr. D. G. Revell, University of Alberta, Edmonton South. Secretary-treasurer—Dr. T. H. Whitelaw, Medical Officer of Health, Edmonton.
Annual Meeting, Edmonton, 1918.

ASSOCIATION OF MEDICAL OFFICERS OF THE MILITIA:—President—Lt.-Colonel A. T. Shillington, A.M.C., Ottawa. Secretary—Captain T. H. Leggett, A.M.C., Ottawa.

ASSOCIATION OF MEDICAL OFFICERS OF NOVA SCOTIA—President—Dr. George E. DeWitt, Wolfville. Secretary—Dr. W. W. Hattie, Halifax.

BRANT COUNTY MEDICAL SOCIETY:—President—Dr. E. R. Secord, Brantford. Secretary—Dr. M. N. Faris.

BRITISH COLUMBIA MEDICAL ASSOCIATION:—President—Dr. J. Glen Campbell, Vancouver. Secretary—Dr. H. W. Riggs, Vancouver.

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The Canadian
Medical Association Journal

Vol. VIII. APRIL, 1918 No. 4

MODERN CONCEPTIONS OF CERTAIN IMMUNITY REACTIONS AND THEIR PRACTICAL BEARING

By Horst Oertel,

Montreal

THE subject of immunity is perhaps the most difficult to master, and certainly, the most difficult to present. It requires expert knowledge in pathology, bacteriology, physics, chemistry, and mathematics, and the vast literature which has accumulated dealing with its various branches and details, necessitates very careful study, critique, and analysis for proper understanding, interpretation, and to shape it into anything like a connected tale.

In addition to these general difficulties there exist other, more specific, ones: some investigators exhibit a peculiar desire to enlarge and generalize individual observations to new theories and swell the science with new names, instead of tracing relations and summarizing results under well-known laws. Thus, various immunity reactions such as phagocytosis and the, once famous, opsonins, have been elaborated into quite independent theories without regard to each other or to other reactions and the possibility of uniform explanation. To-day it appears that many phenomena of immunity once regarded distinct, represent only different expressions of essentially similar physico-chemical laws. I do not propose to give here a general discussion of immunity, I propose instead, to select a few of the practically most important immunity reactions, recall their foundations in the facts, develop their probable explanations and relations, and thereby make

Read at the meeting of the Montreal Medico-Chirurgical Society, January 18th, 1918.

clear their practical applications. Finally, I shall add some preliminary remarks concerning the relation of physical environment to immunity, a study which is at present being conducted by Dr. Gross and myself in the laboratories of the Royal Victoria Hospital and of McGill University.

All acquired immunity may be grouped (as generally known) under three headings or, as being represented by three phases:

First. Immobilization, anchoring of the infecting agent and its annihilation (bacteriolysis, agglutination, precipitation, phagocytosis); that is active immunity. The body takes an active part in its production.

Second. Neutralization of poisonous products (anti-toxic immunity); that may be either active or passive immunity, because it may be transferred from one individual to another.

Third. The creation of conditions which are locally or generally unfavourable to settlement or growth of infecting agents by modifying the physical and, possibly, chemical constitution of the tissues. This last one, the importance of which we are only just beginning to appreciate, is really quite distinct from the first two, for it is not a direct defense against an agent at all, but depends upon cell and tissue properties and surroundings which do not allow union of infecting agent with cells. It is the factor which is undoubtedly of the greatest importance in natural immunity. In acquired immunity the first two are only steps to reach the third. But it must be admitted that in acquired immunity the creation of conditions which are locally or generally unfavourable to settlement or growth of bacteria is not always reached, or only imperfectly. I shall postpone reference to this phase of immunity, the most interesting and, in a way, the most important one until later, as the problems of acquired immunity are best considered before approaching natural immunity.

Much of what follows will be well known to many, but is here inserted for completeness sake and for those who have been unable to keep pace with the progress of immunology.

It was in the eighties of the last century when Buchner, Flügge and Nuttall[1] made the important discovery that normal blood serum possessed the power to kill bacteria, and that this "bactericidal" property of the blood diminished with the age of the serum and could also be destroyed by exposing it to a temperature of 56°C. This was followed by the discovery of Pfeiffer that cholera bacilli injected into the peritoneal cavity of cholera-immune guinea pigs were promptly killed and dissolved. This

phenomenon, known as Pfeiffer's phenomenon, was later shown to take place in vitro as well and this, in cholera immune serum much heightened, power to dissolve cholera bacilli could be diminished or destroyed, as in normal serum, by heat. Bordet found, in addition, the important fact that serum which was thus "inactivated" by heating could be "re-activated", so as to regain its original destructive effect on bacteria, by adding any other normal serum. The same was found in regard to other bacteria and from these observations it was concluded that these specific, strong bactericidal properties of a serum immunized against specific microörganisms are due to two conditions, or as was believed, substances; the one contained in every serum, which is easily destroyed by heat; the other specific to the immune serum and stable. The first is now commonly spoken of as complement, the second as amboceptor (ambo = both, capio = I take) or antibody. Just how both of these act to produce solution of cells is a matter of discussion and does not directly concern us here. It is sufficient to remember that solution of foreign cells in an immunized body is brought about by a combined action of amboceptor and complement, which uniting, attach themselves to the specific cell against which they are directed, thereby producing its solution. Any substance which when introduced into an animal organism excites the formation of a specific antibody is known as antigen. Bacteriolysis or solution of bacteria is, therefore, spoken of as an antigen-antibody (amboceptor) complement reaction.

Bordet, continuing these researches, found that this principle does not only apply to bacteria, but to other cells foreign to an organism and that the repeated introduction of foreign cells, say red blood cells of one animal injected into another, increases the ability in the serum of the second animal to dissolve the cells injected from the first. Upon this discovery rests the principle of hæmolysis.

If we, for example, inject a rabbit several times with a few c.c. (3 to 5) of defibrinated sheep's blood, or better still, with washed red cells of the sheep, the rabbit serum acquires the property of dissolving the red blood cells of sheep and we say the rabbit has been immunized against sheep cells. In such a case the hæmoglobin passes into solution and the test tube fluid assumes a claret red hue.

The process of hæmolysis is not a destruction of red blood cells, but simply a solution of hæmoglobin from the cell discs.

These remain behind, as a pale scaffold, suspended in the fluid. Hæmolysis has been shown to follow essentially the laws of bacteriolysis, that is, in our example, the sheep cells, when introduced into the rabbit, lead to the formation of a specific amboceptor (antibody) in the rabbit which in the presence of complement dissolves the hæmoglobin from the red blood cells of sheep. If we inactivate the sheep-immune serum of the rabbit by heating it, no solution will take place, but the solution will again occur, if we should add some normal serum, because then we supply the necessary complement to cells already bound to the antibody. Such cells, which are attached to their antibody (amboceptor), but still without complement are called "sensitized".

Now a further important observation was made by Bordet, in 1901, in what is known as complement fixation, which since then has assumed very great practical importance. If we take a bacterial emulsion, say of typhoid bacilli and add its inactivated immune serum (serum from a typhoid patient) plus complement and then to this mixture of antigen-amboceptor-complement add sensitized red blood cells i.e., red blood cells with their specific, but inactivated serum, no hæmolysis will result. If, on the other hand, we take a typhoid bacillary emulsion and add normal serum plus complement and then add to this mixture of antigen-O-complement sensitized red blood cells, hæmolysis will take place. Plainly, in the first experiment antigen (typhoid bacilli) plus its amboceptor, plus complement have firmly united so that complement is no longer available for the completion of the added inactive hæmolytic system; in the second case, antigen (typhoid bacilli) no amboceptor, but only complement, the latter remains free and may then complete the added inactive hæmolytic system. In other words one antigen-amboceptor-complement combination fixes the complement firmly so that it is no longer available to complete another added inactivated system. This important discovery of complement fixation has since then been extensively used for diagnostic purposes, that is, to test whether a suspected serum contained a specific antibody or not. The hæmolytic system is introduced simply as a convenient colour indicator. If a patient's serum plus an antigen fixes complement so that sensitized blood cells which are added do not hæmolyse, the serum contains the specific antibody, the patient, therefore, passes or has passed through the suspected disease, if, on the other hand, the patient's serum plus an antigen does not fix complement so that added sensitized red blood cells undergo hæmolysis, it is

plain that the suspected serum did not contain the sought for amboceptor, the union or fixation of complement is, therefore, not accomplished and it remains in solution to complete the added sensitized red blood cells to their antigen-amboceptor-complement hemolytic system; that is, hæmolysis takes place.

Upon these observations rests the original rationale of the Wassermann reaction for syphilis: Wassermann took extracts of syphilitic organs as a convenient way of furnishing antigen; mixed these with the serum of a suspected case of syphilis in the presence of complement, then, after incubation, added sensitized red cells. It was found that under those conditions syphilitic serum fixed complement, that is, no hæmolysis took place, while normal serum did not possess that ability and hæmolysis occurred. Absence or occurrence of hæmolysis, as an indicator showed thus presence or absence of syphilitic amboceptor (antibody) in suspected sera.

There are several points which were plain from the start in relation to this and similar reactions. First, that it is strictly quantitative, so that all reagents employed, antigen, amboceptor and complement must be quantitatively titrated in order to determine their strength, before they can be employed for a reaction. Secondly, that certain technical precautions must be taken in order to obtain reliable readings. This applies particularly to the interpretation of what constitutes a positive reaction, for there are many cases in which the hæmolysis is only partial or incomplete and in which it is doubtful whether this is produced by unfixed complement or, possibly, by a certain hæmolytic property possessed by the human serum to be tested. Only the straight cut, complete occurrence or absence of hæmolysis are decisive negative or positive reactions, partial reactions, i.e., partial hæmolysis (often indicated by one plus or two plus by laboratory investigators) are not to be regarded as positive Wassermann reactions. In order to avoid these errors and to simplify the procedure various modifications of the reaction have been introduced. It follows that the physician or surgeon should have some intelligent acquaintance with the technique and manner of interpretation of the laboratory worker to understand and apply results properly. I will not enter any further upon these technical considerations,—important as they are,—for here we are concerned with the nature of these reactions, their immunological significance and practical applications. We have spoken of antigen, amboceptor and complement as though they were definite chemical

substances and reacted as such, and indeed, although the nature of these substances has always been unknown, it was generally believed until very recently that the union between antigen, amboceptor and complement is a definite chemical reaction and Ehrlich's well-known theory of immunity rests entirely on the supposition of the chemical nature of immunity. But continued observations have disclosed facts which have given complement fixation, generally, and the Wassermann reaction, in particular, a different meaning and significance. In the first place it developed, as regards the Wassermann reaction, that we are not dealing with a specific antigen, antibody, complement union. For not only syphilitic organ extracts, but alcoholic extracts of normal organs serve the purpose of fixing complement in the presence of syphilitic amboceptor. Further experiments disclosed that the essential substance or substances which fulfil the duties of antigen in these extracts are lipoids, very complex, physically fat similar substances many of which contain N. and P. as the lecithins, and that, as shown by R. M. Walker,[2] these lipoids need not even be animal, but vegetable, and enter, quite irrespective of their source, into antibody complement fixation. Moreover, it was found that the fixation of complement is accomplished by colloidal substances like casein, silicic acid, barium sulphate, etc., and Muir[3] has demonstrated the retention of complement by the Berkefield filter, through which it passed after a time unaltered. From this and other experiments it appears that the fixation of complement is influenced by the surface of the substance to which it is fixed and in the organ extracts which are employed in antigens the surface of the suspended lipoid particles plays an important rôle in the fixation of complement.[4] Clearly, we are not dealing here with chemical reactions, but with physical phenomena characteristic of colloids, substances, which since the time of Graham have been recognized as large molecular, insoluble, non-dyalisable complexes which exist in solutions either as dispersoids or emulsoids. The antigen or antigens for the Wassermann reaction have then only this in common that they are colloidal lipoids, but they are not chemical individuals. With regard to the antibody or amboceptor it has also been found that it is not exactly speaking specific, but, on the contrary, it seems to be a lipoidal complex in combination with a proteid of euglobulin nature and, therefore, also behaves as a colloid. Moreover, comparative strength reactions of antigen, amboceptor, and complement do not follow the chemical laws of multiple pro-

portions. The importance of this was early emphasized in the technique of the Wassermann reaction by Noguchi[5]; and recent investigations of R. M. Walker have further shown that the union of complement to so-called antigen and so-called antibody follows essentially the laws of adsorption; thus, when the concentration is doubled, the amount adsorbed does not equal 2, but less, namely 2 to the power $\frac{1}{N}$.

Taking all these facts into consideration it is clear that the Wassermann reaction is a colloidal adsorption phenomonen and no chemical reaction; it depends for its occurrence upon the presence of lipoidal proteid complexes in the serum of syphilitics which, when put in contact with other lipoids extracted from any lipoid rich organs, possess the ability to adsorb complement. What determines the specific adsorption and fixation of these substances to each other is at present impossible to say. I will only say, as a reminder, that adsorption is essentially bound to surface tension, that is, work may be done by the surface of a liquid when the tension is able to diminish. Substances of great chemical stability only slightly lower surface tension when spread on water, some, like ether spread widely and greatly lower surface tension. Bayliss[7] suggests that this is due to decomposition at the interface between liquid and air and between solution and a solid, or immiscible liquid. At these interfaces there is, therefore, a local accumulation of free surface energy which can be altered by the deposition of substances at the interface. From the Gibbs-Thompson law of energetics it follows that substances which lower surface tension will be concentrated in this situation, because the energy will be lessened thereby. Accordingly, any substance in solution in contact with the surface of another phase will be concentrated on that surface, if thereby the free energy present is decreased. This is adsorption and characteristic in its relation to surfaces of contact.

The exact condition controlling the adsorption of colloids are as yet not well known and also not the factors determining specific adsorption in mixtures. It is very likely that related physical configuration of molecular complexes are of importance in this respect. These considerations are not only of theoretical, but great practical importance, for the specificity of the Wassermann reaction has thereby been much limited. We are enabled to understand now better the gradually increasing number of instances in which the Wassermann reaction is positive in non-syphilitics and the lack of the reaction at times in syphilitics.

As a result of long continued observations carefully carried on by Dr. Bruère in these laboratories and by other observers, it may be laid down as a general proposition that any agent which either increases or diminishes the lipoid protein contents of the blood interferes with the reaction so that the results are unreliable as a test for syphilis. Under such conditions positive or negative reactions may occur. Thus, during digestion (particularly after fatty meals), acidosis, lipæmia, and after chloroform or ether narcosis, the blood may give a strong Wassermann reaction in non-syphilitics, that is, lipoids are dissolved and thrown into the blood. On the other hand it appears that the reaction after long chloroform or ether anæsthesia may become negative in syphilitics, possibly, because much lipoid has been dissolved out of the blood. Thus, the blood may also be negative and the cerebro-spinal fluid positive. The same applies to infectious diseases, especially where, as in pneumonia, rapid resorption of large amounts of inflammatory exudate occurs or in ulcerating tumours. Here also the blood becomes rich in euglobulin which is one of the components of the amboceptor in syphilitic blood.

This very practical lesson must, therefore, be drawn, that, in order to obtain a reliable test for syphilis with the Wassermann reaction it is necessary to use the following precautions: First: Blood must be taken directly from vessels, avoiding the skin, (subcutaneous fat), and not by blister or cupping. Second: Blood should never be taken (a) after a meal (but while fasting), (b) during a fever, (c) during any acute infectious disease, (d) during suppurations or resorptions of large inflammatory exudates (pneumonia, empyema, etc.), or even in ulcerating or necrosing tumours, (e) after narcosis. As a second proposition, it may be put down that a negative Wassermann does not necessarily exclude syphilis.

I do not want to be understood as discrediting or underestimating the value of the Wassermann reaction in the diagnosis of syphilis. But our experiences, together with those of others, emphasize the necessity of proper precautions in obtaining the material (blood) for, and the relativity of, the reaction. Here, then, theoretical considerations as well as practical results meet and combined give us an intelligent understanding and a reliable application of a complicated immunity reaction.

The principles underlying the Wassermann reaction have possibly a much wider and general application to immunity. For instance, if a given quantity of diphtheria antitoxine is added to the toxine in fractions, neutralization of more toxine occurs

than when all is added at the same time.[7] This is also true of ricine, the toxic principle of the castor bean, and antiricine; if ricine is added in separate amounts to antiricine, more antiricine is necessary for neutralization than when all ricine is added at once. It has also been shown in the frog that adsorption of tetanus toxine by the nerve trunks occurs at low temperature, but poisonous effects do not occur until the animal is heated to 20° C.[9] Even the chemical specificity of the amboceptor or anti-body in other immunity reactions is not quite certain; it may represent only an increased production of substances normally present in tissues and fluids which under certain conditions and influences form large colloidal complexes and by selective adsorptions pose as specific chemical compounds and reactions.

From what has been presented, it appears that the phenomena of immunity are, partly, of complicated colloidal character, largely of the nature of adsorption, partly, adsorption plus chemical union of at present quite unknown substances. We must remain conscious of these facts in applying immunity reactions to the practice of medicine.

Let us now turn to another phase of immunity which at first sight appears far removed from the Wassermann reaction, but which careful reflection shows very closely related to it. I refer to chemiotaxis and phagocytosis. Movement and ingestion of foreign particles such as food, bacteria, pigment, are fundamental characteristics of life and possessed by all free cells. Both were once regarded as specific of living forms, and in a way, intelligent expressions of life and useful efforts of protection. To-day we know that these functions are by no means confined to living matter, that both properties follow essentially the laws of surface tension in cells as in non-living substances suspended in fluid. When a drop of a fluid is suspended in another, the particles of each fluid are, as is well known, under a considerable cohesion force which holds them together. Within the drop suspended in the fluid the force is equalized by each particle being subjected to the same pressure or force from all sides. But the particles on the surface of the drop are exposed to unequal pressure, for that of the outside fluid is different from that of the drop, so that the surface particles are exposed to the pressure of the two fluids, and this is surface tension. The surface tension endeavours to reduce the free surface to a minimum and this is perfectly represented by the sphere.

But the cohesion affinity and power varies in fluids so that

some have high, some low surface tension. Again, if substances are dissolved in another the resultant surface tension equals that of the two substances.

If, then, on a point of the surface of a drop suspended in another fluid, the tension is lowered, remaining stationary elsewhere, the drop will bulge and flow in that direction. If, on the other hand, the surface tension is increased at a given point, the wall of the drop will be indented, and the whole drop will flow away from this increased tension towards less resistant parts. Thus we have movements closely simulating positive and negative chemiotaxis. If, for example, we take a drop of metallic mercury and suspend it in a flat Petri dish in a 10 per cent. solution of HNO_3, the drop will assume the shape of a sphere. Suppose we now put a crystal of potassium bichromate in the solution close to the mercury. As the crystal dissolves and strikes a point on the surface of the drop of mercury this is oxidized, the surface tension thereby lowered and the drop projects in this direction, sends out pseudopodia and ultimately moves towards the crystal, around which it will execute the most active and bizarre motions, apparently battling with it until the surface tension has again been equalized by the solvent action of the acid on the oxide, then the mercury assumes once more the quiescent form of a sphere.

This is, of course, a very simple and, in a way, crude experiment, but we owe to Ludwig Rhumbler most interesting and elaborate observations which show that chemiotaxis as well as phagocytosis are fundamentally surface tension phenomena.[10] An amœba, leucocyte or other cell are, physically considered, a drop of a colloidal suspension surrounded by a delicate surface layer which is more or less readily permeable to solvents and substances in solution. In any fluid this colloid drop is suspended in a liquid of different composition. These conditions may be imitated in a simpler fashion by suspending a drop of clover oil or chloroform in glycerol and weak alcohol with which it will gradually mix. Such a drop will move about, send out pseudopodia and change its form as an amœba does. If some strong alcohol is added near the drop, the surface tension on this side will be lowered and the drop will flow in that direction (chemiotaxis). It will also flow towards a heated point, because heat lowers surface tension. But further, even the ingestion and choice of food may be artificially produced. A drop of chloroform in water or weak alcohol, will refuse certain substances, as glass or wood, and, if introduced, will expel (vomit) them; but if a

piece or thread of shellac, vulcan or paraffin be brought into contact with it, the drop will, in amœba fashion, flow around it. Even more, if a thread which an amœba ingests is too long, it stretches along the thread and by bending it, crowds the thread into a coil within its body. This looks like a voluntary or instinctive action, but Rhumbler showed that when a long thread of shellac is offered to a drop of chloroform, it proceeds to bend the thread in the middle, sends out psuedopodia along the thread to pull it in, coils it up inside and then digests it. A thread six times as long as the drop of chloroform may thus be taken in.* Moreover, if a piece of glass rod is covered by shellac and then introduced into the chloroform drop, the shellac is retained, but the glass rod expelled. Even the formation of shells by certain protozoa (difflugia) has been imitated by Rhumbler by mixing oil with quartz grains and 70 per cent. alcohol. The grains are thrown out to the surface of the oil drops and adhere to one another as they do in difflugia, and these artificial shells remain intact for months. While the amœba and other cells are certainly much more complicated in their make up and, therefore, in their physical relations to the outside, these experiements strongly suggest that, at least, many of the elementary motions and actions of cells are exhibitions of changes in surface tension. This is also borne out by the observations on the behaviour of higher tissue cells towards certain reagents. Thus, B. Fischer, found that the injection of sudan or scarlet red in oil, into the ear of rabbits caused dissociation of the surface epithelium, and growth and migration towards the sudan. The same influence has been found after the application of coal-tar, ether and, generally speaking, lipoid solvents, as also in artificial parthenogenesis by J. Loeb.[11] The term chemiotaxis is, therefore, strictly not correct, for the attraction of cells does not depend upon chemical affinity, as once believed, but upon physical changes in the environment of cells. It is probable that the emigration of leucocytes in inflammatory exudation depends upon the same phenomena, for the products of cell disintegration and inflammatory irritants lower surface tension in the tissue fluids. When these diffuse into the blood they will necessarily attract leucocytes in the direction of the greatest lowering of the tension. They pass then through stomata of vessels and move in the tissue fluids until the tension is once more equalized. The changes in size and shape of inflammatory cells after exudation,

*These experiments are regularly demonstrated in my lectures on general pathology before the class.

their polymorphous character and the fusion of cells to giant cells are also largely governed by the physical factors of their environment. If we take small particles of camphor and throw them into water, they exhibit very active motion. If we now cover the surface of the water by a thin film of oil and thus equalize surface tension, the camphor particles come together, agglutinate and form large irregular masses, as occurs in cell agglutination and cell fusion.* We may, therefore, conclude that, as the Wassermann reaction depends upon phenomena of surface energy (adsorption) so chemiotaxis and phagocytosis depend fundamentally upon the phenonema of variations in surface tension. It is clear, therefore, that what was called opsonins and opsonic variations are essentially not chemical, but physical phenomena.

Now, finally, a few more words bearing on natural immunity. At the beginning it was stated that the third phase of immunity in a way the goal of immunity, is the creation of conditions which are unfavourable to settlement and growth of infecting agents by modifying the physical and chemical constitution of tissues. We have known for a long time that individuals may carry after an infection, or even never having undergone any infection, virulent bacteria, and these individuals, so important from the epidemiological standpoint, are spoken as of "carriers".

Instructive in this regard is especially gonorrhœa. For we know that the gradual adaptation of the gonococcus to the urethral mucus membrane is not due to any antibactericidal action of the tissues, but that the gonococcus continues fully virulent and that, therefore, the inflammation excited by this irritant does not, in this instance, heal by decreasing the virulence of the invading agent.

We also know that venous congestion, although in other respects rather detrimental to cell life by asphyxia and increased H. ionization of the tissues, is unfavourable to settlement and growth of bacteria. Bier's famous treatment of tuberculosis depends on this observation.

How can these perplexing questions be explained? It would seem that here also complex physico-chemical conditions of the tissues are involved which make an attack, or better expressed, a union of bacteria to cells impossible.

For it appears, from recent observations with which Dr. Gross

*An ingenious experiment of this kind for class demonstration by the epidiascope has been designed by my colleague, Professor Francis Lloyd of McGill University.

and I are now engaged in my laboratories, that the colloidal state of cells and their physical environment are here of great importance.

We have deviated in our studies of natural immunity from the general custom of employing complex animals, but have chosen the simplest kind of protozoal organism, the paramæcium, for our studies. This we have been, and are still growing under varying physical influences with pathogenic bacteria. We have thus observed that the ability of pathogenic bacteria to attack and destroy paramæcia depends to a considerable extent upon physical factors, such as salt contents of the media, that, for example, in higher salt concentrations paramæcia are more vulnerable than in lower or saltless media (swelling and hydrops of cells). These studies, which are not yet finished and which will appear in detail elsewhere, may give us a clue to the therapeutic effect of venous blood congestion and to natural immunity.

One of the difficulties in studying immunity has been that observations have been made almost exclusively amongst the highest and most complex animals in which it is extremely difficult to control the various steps and possibilities in an experiment. It is hoped that the study of simpler organisms will in the future clear up at least some of the many questions and problems still to be solved.

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11. This whole matter is well reviewed by Borst; Das pathologische Wachsthum; "Pathologische Anatomie" by L. Aschoff, 1911, i., p. 555, ff.

(In regard to coal tar it has recently been claimed by Yamagiwa and Ichikawa that its repeated application causes typical cancerous growth. *Journal of Cancer Research,* iii., 1. 1.)

Mr. James Manuel, who died at Ottawa on February 20th, was the founder of the Ottawa Anti-tuberculosis Association and a vice-president of the Canadian Association for the Prevention of Tuberculosis. Mr. Manual was greatly interested in hospitals and charitable work and it was largely due to his efforts that the Royal Ottawa Sanatorium was established. As treasurer of the County of Carleton General Hospital, Mr. Manual proved himself invaluable and it was due to his wise counsel and frequent aid that this institution was placed upon a sound financial basis. He was also a generous benefactor to the St. Luke's Hospital and the Young Men's Christian Association.

NOTES FROM A CANADIAN HOSPITAL IN THE NEAR EAST

LIEUTENANT-COLONEL E. J. WILLIAMS, D.S.O.

Commanding No. 1 Canadian Stationary Hospital

THE nature of the work in a military hospital depends in a great measure upon its military and geographical location. Certain factors, such as a proximity to the fighting line, the number of hospitals alloted to a Division or Army, climatic conditions, health of personnel, ease or difficulty of transportation, water supply, etc., determine the "fate" of a hospital unit to a great extent.

In the near East many difficult problems have been faced which have taxed the resources of those in charge of the Medical Service to the utmost; a few of these I will enumerate.

Climatic conditions and sickness in personnel of units. It is a recognized fact that a large percentage of individuals arriving in the East from England or the northern parts of Europe, develop within a period of two or three weeks an illness which in this area is popularly termed "*Mal-de-Salonique*". In the summer months this takes the form of acute diarrhœa, sometimes a dysentery of a severe nature lasting for weeks. One of the predisposing factors is thought to be a chilling of the body surface, especially of the abdominal wall, during the cool evenings following the hot days, hence the use of body or cholera belt to prevent its development. After one has lived in the country a few months he learns the value of this protection in the hot weather.

In the fall and winter it manifests itself in the form of an indefinite fever with malaise, loss of appetite, headache, and pains in the muscles and joints. The condition is often diagnosed as P.U.O. (pyrexia of unknown origin). In many cases the condition becomes quite severe and may incapacitate a man for weeks.

Under these circumstances the work of a new unit is often particularly hard on account of the large number of casualties in the personnel.

The two common tropical diseases, malaria and dysentery,

Received for publication September 15th, 1917.

are also serious factors in the matter of reduction in the strength of the personnel of a unit, when these diseases make their appearance.

The difficulty of eradicating these diseases from the system under the existing conditions is great, with a consequence that a great percentage of the personnel may be affected with one or both at the same time. Recurrences are common, periodically rendering the individual unfit for duty. Both of these diseases manifest themselves in a much different manner from the classical form described in text-books and commonly seen in India and other tropical countries. The consensus of opinion among medical officers in this area, who have had extensive experiences in tropical medicine, is that the types of diseases here are of a more severe nature than elsewhere.

Heat stroke and heat exhaustion are not uncommon in mid-summer but the period of extreme heat is not long, so that the number of cases developing in a year is comparatively small.

During the summer months of 1916 (April to October), the mean temperature was below 78°. June has the highest average it being about 90°, while the hottest day in 1916 in this section was 110°.

The heat is not oppressive so that one may feel fairly comfortable on a day with the thermometer registering 90°, as there is generally a fresh breeze blowing, and the humidity is not great.

With regard to the class of cases admitted to a military hospital here, a large percentage are medical, the proportion being twelve medical to one surgical during a period of twenty-two months, malaria and dysentery contributing more largely to the list than all others combined.

As previously mentioned, the clinical course of these diseases especially malaria, is most atypical, which condition is probably due to the "host" and environment, and not the infecting organism.

The number of cases of dysentery admitted at this base is small, compared to our experience on Lemnos Isalnd, where the medical personnel were afforded an exceptional opportunity for studying both types (amœbic and bacillary) of the disease. A very few cases of so-called trench fever and trench nephritis have been treated, while of the commoner diseases met with in everyday life, these have been a very small proportion.

In the surgical section, although the work has not been extensive, many interesting head, chest, and abdominal cases have been treated.

The co-existence of malaria with a surgical condition handicaps the surgeon, both in the matter of wound treatment and diagnosis. A clean appendix case may go along nicely for some days following operation and suddenly the temperature may rise to 103° or 105° —no chill, just a slight feeling of malaise.

The surgeon naturally becomes anxious, but soon his fears are allayed by the report from the bacteriologist who has demonstrated plasmodium malariæ in the blood smear, or the clinical manifestations are quite apparent.

In many cases, the presence of malaria infection in a patient recently operated upon, leads to a cessation of the healing process in a clean wound with the consequence that when the supporting stitches are removed it opens from end to end. This extremely annoying complication generally entails a great deal of attention on the part of the surgeon on account of the prolonged wound treatment, as also that of the complicating condition—malaria. As a rule these cases eventually do very well.

The food supply has been uniformly good in quality and quantity and can be readily supplemented by native grown products such as vegetables and fruits. Besides this a great many units have planted their own mess gardens. These are now (July, 1917) yielding potatoes, tomatoes, beans, peas, etc. In some instances there are divisional farms.

Transportation. In a country practically devoid of railways, possessing very poor highways sparsely spread over thousands of square miles of rough mountainous areas, the difficulty of transportation can easily be imagined.

In one section alone, with a line of communication of over fifty miles, there is no railway and only one highway over which all troops, supplies, sick and wounded, must be transported; so the difficulties which present from day to day seem at times almost insurmountable. The labour required to maintain the road in a passable state is stupendous, and were it not that the weather conditions are so favourable for the greater part of the year, the task would be next to impossible. During the earlier part of the eastern campaign the transportation of the sick and wounded was a serious problem, especially from the point of view of the patient, with the consequence that much of the work commonly done in the stationary and base hospitals was carried out in field ambulances, casualty clearing stations, and stationary hospitals.

The latter in some instances were placed along side clearing stations nearer the front line, well advanced along the line of com-

munication. Large convalescent depots also have been established in connexion with different divisions at short distances from the front line for the treatment of the milder cases, thus reducing the strain on transportation besides saving the patient from ill effects of a long journey over the rough roads to the base. This latter has been a very potent factor militating against the patient's health.

Over a portion of this line, railways are now being built which will add much to the ease of transportation of the sick and wounded.

Disposal of patients from hospital. The man evacuated from hospital as permanently unfit is "marked out" for Engand. One who will not be fit for duty within six or eight weeks was, until recently, sent to Malta, but is now retained at this base.

If one studies the map, a difficulty peculiar to the East presents itself in the long distance between Salonica and these other two points, also in both instances it is sea travel.

The recent increase in the number of hospitals at this base, also the additonal accommodation added to those already here, has effectually solved the difficulty which resulted from the reduced service of hospital ships owing to the submarine campaign. Large convalescent camps have been established, and others are in the course of construction. The location of these is most favourable, being elevated plateaus overlooking the sea, practically free from mosquitoes and from ten to twenty degrees cooler than the city of Salonica and immediately surrounding parts, whilst others were established on a large peninsula jutting out into the sea where the bracing sea breezes and salt water bathing do much towards hastening the convalescence of the sick soldiers.

This change in arrangements will no doubt add much to preserving the efficiency of the troops. Although there are serious difficulties to contend with, there are, on the other hand, many favourable features about Macedonia. The weather during the greater part of the year leaves little to be desired. During the months of June, July, August, the temperature frequently ranges from 90° to 106° but the average is much lower than this, being about 80°.

The nights are never excessively warm even during the hottest periods, but as a rule pleasantly cool and there is a more or less constant breeze from the sea or the Balkan mountains on the north.

The health of the troops, barring malaria and dysentery, has been exceptionally good. The elevated plateaus along the sea and inland are particularly well suited for hospitals and convalescent depots.

The water supply for the army was a question which, during the early days of the occupation of Salonica by the Allied force, caused not a little worry; not with regard to those in and about Salonica, where there is an abundant supply from the ancient aqueduct, but the troops encamped on the plains and mountains farther north.

However, no particular difficulty has been experienced, as springs in the different parts of the cuntry have proven more constant than was at first anticipated.

The question of drainage of the great plains in the minds of engineers here, does not seem to present very great difficulties, so that ere long we may see this portion of Macedonia one of the healthiest and wealthiest agricultural countries in the world.

In the matter of diversions and amusements, many concert troops have sprung up during the past year. These go from unit to unit (especially hospital units) giving concerts of varied types to the entertainment of the soldiers. The talent which is "discovered" at times is quite surprising and pleasing. Many London artists are serving in the Salonica forces, hence one may find four or five in a single company, in which case one may be sure of seeing and hearing a really first class production. Altogether, life in the East is most interesting, the customs and habits of the people, the ancient synagogues, churches, and mosques, the cosmopolitan population of Salonica where one may see in the course of an hour's walk through the streets the Greek, Bulgar, Serbs, Spanish, Jew, Roumanian and more rarely the Austrian and German.

Adding to this the military population, we have the British, Canadian, Australian, French, Russian, Italian, Serb, Montenegran, Algerian, Sinegalese, Amanite, etc., etc.

With all these interesting factors which surround one here, it might be surmised that one would have enough to engage his attention for years to come. However, after two years' sojourn fighting malaria and dysentery one feels quite satisfied to say good-bye to these fascinating surroundings and turn one's face towards home, leaving the Easterner to enjoy his habits and customs of life to himself.

AN EXPERIENCE THROUGH THE HALIFAX DISASTER

By Captain Frederick T. Tooke, C.A.M.C.

Montreal

THE recent catastrophe at Halifax has apparently come and gone. Passed, perhaps to many at a distance whose near point is always fixed in relation to their preoccupation with the affairs of the moment and within their own very limited range of vision; an event never to be forgotten in life's experience on the part of those whose fortune drew them to the help of that unhappy city.

Call the event an accident, a blunder, the part of an organized plan, define it as you will, it must still remain a tragedy of the war and be particularly considered as such as any event that has happened in France or in Flanders. Far be it from me to dare to assume the rôle of an armchair critic at such a distance regarding what is happening overseas. I have, however, seen Halifax and I do happen to know what has happened there. A well-known officer of one of Canada's most brilliant battalions enjoying the distinction of a Master of Arts degree as well as a Distinguished Service Order decoration with bar, a scholar no less than a soldier, told me on driving me home to my billets one night after work, "the war has nothing on this, and I have seen the worst of it."

Be it an act of war in our own country, or approach it from any angle that may suit your own personal idea or opinion, however ridiculous or however improbable, I wish to state at the outset that I am glad that I was there. More than that, I would acknowledge with deep gratitude the privilege and the unusual opportunity accorded me, probably that of a lifetime, of helping suffering humanity; an occasion which might equally well have fallen to another and a duty that might have been fulfilled by another with more brilliant results if not by greater zeal and honesty of purpose.

The occasion could not have been staged with greater tragedy: the horror of its results could not possibly have appealed to anything other than what we are pleased to term our better selves. The whole affair was in many respects a revelation with respect to our regard for human nature.

A record of the events of any human experience, however satisfactory or however satisfying, is seldom published without being weighed down by an if or a but. Our recent adventure is no exception to such a general rule. My only regret is that our call for help from Halifax had not been made more immediate and that we could not have arrived on the scene twelve or eighteen hours earlier. It would appear that the delay was unavoidable for obvious reasons.

On December 8th, I was ordered by Lieutenant-Colonel Patch, A.D.M.S., Military District No. 4, to proceed at once to Halifax and report for duty to Lieutenant-Colonel F. McKelvey Bell, A.D.M.S., Military District No. 6. My only instructions were that with the recent explosion an unusual number of eye casualties had occurred and that an eye surgeon was urgently needed. I left by the first train available, taking a complete set of eye instruments. Through the courtesy and thoughtfulness of the authorities of the Royal Victoria Hospital who had heard of the order, Miss Etter of the nursing staff of the Ross Pavilion was detailed to accompany me for special duty. The trip to Halifax was uneventful but for its discomfort. We started out in a blizzard; much delay was experienced the first night driving against snow drifts. The following morning when connecting with the commissariat department at about ten o'clock, five hours late, we were put on very much reduced rations. Only two rather meagre meals were served by the dining car. Later on as the day grew dark, the electric light installation went out of order, a dim and almost inconspicuous light flaring up brightly only every few revolutions of the wheels. As we were dependent upon two candles during the intervening space of time the effect on the eyes was the same as frequently testing pupillary reaction, and the result was headache. Our delay of six hours was in many ways an unmixed blessing for we were able to get a second rather comfortable night on the train rather than undergo the anticipated difficulty of looking up billets in the early hours of the morning in a strange and devastated city.

We arrived at our destination on Monday morning at half past six o'clock. The day was dark and cold and the details of the city could scarcely be made out. The roof of the Canadian Government Railway Station had fallen in, innumerable cars and trucks were wrecked on the sidings, and we were compelled to make our way through a sea of broken glass and over countless obstacles, chiefly wreckage and coffins. One could not begin to count the latter. The sense of depression was almost unbearable. Not a sound could be heard, railway trains were not running, ours had only been the second

to arrive in Halifax, electric cars had been suspended, one could not even hear a motor horn. The streets seemed to be empty. The silence was intolerable and Halifax at first impression seemed to be in fact a city of the dead. We reported to Military Headquarters when I was assigned for duty of Camp Hill Military Hospital, taking Miss Etter with me.

A word of digression, however, regarding the source of the accident, its nature, and some of its effects. Probably a great deal of what I relate to you has already been furnished by the public press. Much detail might be supplied by many regarding the problematical nature of the explosion which I discreetly feel it better to avoid. In brief, the ammunition ship *Mont Blanc*, laden with tri-nitro-toluol in the hold and with benzol in tanks on the deck, was rammed by the Belgium relief steamer *Imo*. With the collision the benzol ignited, and the *Mont Blanc* was soon ablaze. A call was rung in for the Halifax Fire Department. The peculiar glare from the light as well as the ringing of the fire alarms attracted everybody to the windows, principally women and children. An attempt was made to scuttle the burning ship, but without avail. In less than half an hour's time a terrific explosion occurred as the result of the benzol and the tri-nitro-toluol coming together. One must visit Halifax and view its ghastly scars in order to estimate its awful result. Imagine an area bounded by Pine Avenue on the north, Dorchester Street on the south, Cote des Neiges Hill to the west, and St. Lawrence Main Street on the east. An area one and a half miles square was laid flat, not a dwelling was left intact, large trees were shattered. There was not one building in the whole of Halifax without broken glass. The home of the late Lieutenant-Governor McKeen, where I had the good fortune to be billeted, three and a half miles from the source of the accident, had more broken glass than one could count. A fortunate circumstance in many cases as in this was that the double windows had not been put up for the winter.

A few curious freaks showing the frightful force of the explosion. The anchor of the *Mont Blanc* weighing six tons was discovered in one of the dismantled Exhibition buildings three miles away. The ship's 4·3 gun was found a mile away over on the Dartmouth side. Many bodies were found with their clothing literally torn off them without their necessarily having been burned, while one man was carried through the air for a distance of a quarter of a mile, and landed on terra firma, his only misfortune apparently being that a keg of nails had been predestined for his point of alighting.

Verily the days of Münchhausen are still with us. This statement, however, I can vouch for, as the man gave evidence before the Naval Court of Enquiry the day before I left Halifax. But to return to my special mission and my own experiences.

I reported to Major Morris, officer commanding Camp Hill Hospital, the largest unit in action during the emergency. Camp Hill is a hospital designed, equipped, and intended in Halifax as others are contemplated in other Divisions, for returned men who have been invalided home. The estimated capacity of Camp Hill was two hundred and eighty beds, plus the sun parlors. By a fortunate coincidence there was a complete complement of medical officers, staff, and orderlies. Captain John Fraser, A.M.C., was also in Halifax with two hundred reinforcements for the Army Medical Corps waiting for transportation overseas. Owing to Camp Hill hardly having been in action there were only five nursing sisters on duty, two for relief work and one for night duty. When the crash came Camp Hill accommodated 1,630 patients. Let it be said to the everlasting credit of the V.A.D.'s that they nobly filled the breach. Also to that of Colonel McKelvey Bell, A.D.M.S., Military District No. 6, for the perfection and thoroughness of his organization. It was wonderful how quickly it was brought into action for such a crisis and how thoroughly and with what detail the work was carried on. I never saw a large body of men and women work so harmoniously together. Besides the regular workers associated with the Army Medical Corps, there were all sorts of helpers enlisted from all classes of society, making beds, scrubbing the wards, carrying food, feeding the helpless, caring for the children, washing dishes and helping in a hundred and one different ways; mistress rubbed shoulder with maid and char-woman, all imbued with the same desire to help. All the motors were commandeered and women frequently served as transport officers. Although at the dawn of a Christmas season one could shudder with the thought of "Peace on Earth", one was inspired and encouraged with the doctrine of "Goodwill towards Men".

Many of the wounded died the day they were admitted to hospital and for this reason, after the explosion it was quite impossible to prevent terror and panic on the part of the mob, and the rumour spread that the fire was making headway towards the arsenal at Wellington Barracks. A still more serious explosion was anticipated and the poor people fled to the parks, woods, and open places, away from the centre of the city, scantily clad with their ghastly wounds unattended. Here they were overtaken by a terrible

blizzard and rescued by stretcher bearers in a half frozen and almost exsanguinated condition. The mortality was in consequence at first terribly high, largely the result of exposure, exhaustion, and loss of blood, a circumstance for which nobody could be held directly responsible.

Every available bit of space at Camp Hill was taken up. Men, women, and children were first all collected in the same ward irrespective of their condition. Frequently three would occupy the same bed. Patients were even under the beds and between the beds lying on blankets as well as in the corridors. One made one's way through the wards with the greatest difficulty. The day of my arrival the numbers were reduced to nine hundred, and I would pay this tribute to Major Morris by saying that the hospital was carrying on in excellent order. The windows had all been repaired, each patient had a bed or mattress with warm clothing while an abundance of good nourishing food was served alike to patients and staff.

I was taken to a small back room lighted by a single electric globe. Here a man was operating who was introduced to me as Dr. Cox of New Glasgow. I pay my tribute to this small town specialist as well as to Dr. Putnam of Yarmouth, who later came to my assistance. The first mentioned bore the brunt of the first shock of the service. He left his work at home at a moment's notice and travelled one hundred miles to Halifax. He was left four miles out of the city groping about in the dark, frequently stumbling over dead bodies before he was able to reach the centre of the city. He at once put in a twenty-four hour continuous service and after a three hour rest had started again when I discovered him. Most of the night he had been working in the kitchen and operating on the floor. Dr. Cox from his appearance might have been anywhere from forty to sixty-five years of age, such was the result of fatigue in his expression and behaviour. He was manifestly exhausted and he told me that he had done so much work that his instruments would no longer cut. I sent him off to bed and proceeded to take over the service and sort out the material. There were about one hundred and twenty people in the one ward, practically all major operation cases. For this service I had two other oculists associated with me beside Dr. Cox to whom I have already referred. Dr. Cox left for his home the day after my arrival, one member of the staff developed a severe gastric disturbance due to overwork, while the third acquired a paronychia.

Left practically alone I consequently proceeded to form a

"Union Government". Dr. Ames, a general practitioner of Westville, Me., acted as surgical dresser, Mr. Haslam, a fifth year medical student, gave more chloroform and gave it better than I have ever seen it given before. Sergeant Wallace, a returned Army Service Corps man whose like I have yet to find for honesty, energy, and ability, acted as my orderly, while Miss Etter and I completed the team. From this time on operations were undertaken somewhat more cautiously, due to the fact that the most urgent had already been performed.

Let us make a very brief survey of some of the cases in one ward under my care. Anything like complete note-taking was quite out of the question. We were working under such pressure that it was impossible to dilate on a few very sketchy notes without feeling that the more important fact of treating the patients was being overlooked. Sergeant Wallace who was always at my heel with pad and pencil managed to collect these few facts from me which afford one a fair average of the hundreds of such cases in the hospitals of Halifax.

1. W. A. G. Right eye uninjured. Left eye, two long perforated wounds of the cornea, iris prolapsed. Iridectomy and edges of iris freed.

2. Unknown child. Wound of lid with marked induration of tissues. Examination under chloroform, eye uninjured.

3. Mrs. M. A. Both eyes and appurtenances torn to shreds. Remains enucleated, double dressing to orbits, multiple glass wounds of face and neck.

4. M. C. Child about three years. Laceration of left upper lid. Left eye completely destroyed. Lid sutured and remains of eye enucleated.

5. G. A. M. Laceration of lids of right eye, globe normal. Left eye perforated wounds of cornea. Iridectomy and lids sutured. Glass wounds in neck.

6. J. K. Left eye completely collapsed, enucleated. Right eye perforated wounds of the cornea, prolapsed iris, iridectomy.

7. Mrs. R. B. Multiple wounds of left cornea below at temporal side near ciliary margin. Presenting iris excised and flap of conjunctiva sutured over wound.

8. R. F. Multiple glass wounds of both lids. Dressed.

9. J. C. Abrasions of both corneæ. Dressed.

10. J. B. Complete destruction of both eyeballs, large fragments of glass removed from globes after enucleation.

11. Mrs. G. R. Multiple incisions of both lids. Dressed.

12. G. B. Right eye normal. Perforated wound of left sclera up and out. Sutured conjuctiva over wound and applied double dressing for a few days.

13. R. S. Right eye normal. Perforated wound of left cornea. Iridectomy, argyrol, atropine and bandage.

14. G. H. Slight abrasions of right cornea. Condition not serious.

15. A. L. Right eye normal, left eye collapsed, enucleated remains.

16. Mrs. T. A. E. Superficial abrasions of right cornea. Perforated wound of left sclera with prolapse of ciliary body. Excised prolapse and sutured conjunctiva over wound. Atropine, argyrol and double bandage. To be treated conservatively pro tem.

17. Mrs. D. McK. Left eye abrasions of cornea. Perforated wound of right cornea with prolapse of iris. Iridectomy, atropine, argyrol and bandage.

18. F. McK. Left eye normal, perforated wound of right cornea, prolapse of iris. Iridectomy, atropine, argyrol and bandage.

19. Mrs. A. D. Left eye normal. Long perforating wound of cornea extending into sclera and ciliary body. Two other parforating wounds of sclera. Eye enucleated.

20. E. B. Right eye normal. Multiple wounds of cornea. Anterior chamber completely filled with blood. Treat conservatively for a few days.

21. W. H. Left eye normal. Perforating wound of right cornea with prolapse of iris. Iridectomy, atropine and bandage.

22. Mrs. G. A. M. Left eye normal. Right eye completely destroyed. Enucleated remains of right eye and sutured lids.

23. Mrs. A. B. Right eye normal. Half inch perforation of left sclera from corneal margin backward, globe collapsed, enucleated.

24. Mrs. S. R. Right eye completely destroyed, enucleated, large corneal wound of left eye extending into ciliary body above. Conjunctival flap, atropine, argyrol and bandage.

25. A. S. Right eye normal. Extensive perforating wound of left cornea with prolapse of iris. Iridectomy, atropine, argyrol and bandage.

26. Mrs. C. S. Right eye normal, left eye completely destroyed, enucleated remains.

27. T. N. Left eye normal. Oblique wound of left sclera over ciliary body, ciliary body and vitreous presenting. Enucleated.

28. M. B. V shaped ragged wound of left cornea extending into the conjunctiva below. No apparent inclusion of iris or ciliary body. Atropine and bandage both eyes.

29. J. McM. Left eye normal. Perforating wound of the right cornea at nasal side, prolapse of iris. Iridectomy.

30. A. S. Right eye normal. Perforated wound of left cornea at limbus. Iris incarcerated. Iridectomy. Soft lens matter to be evacuated later. Double bandage.

31. F. S. Extensive necrotic wounds of lids and right side of face. Neither eye injured. Moist dressings to lids and face.

32. Mrs. P. Wound of right cornea extending 2 mm. inward to nasal side towards ciliary body. Iridectomy, atropine, and double bandage.

33. Mrs. H. McN. Wound of right cornea at limbus, iridectomy. Edges freed, atropine and bandage.

34. Mrs. S. R. Perforating wound of left cornea with prolapse of iris. Iridectomy. Right eye has already been enucleated.

35. F. B. Perforating wound of right cornea from limbus to centre of pupillary area. Iris incarcerated and fixed about pupil. Iris freed and iridectomy done.

36. Mrs. A. S. Ragged tear of right cornea above in vertical line. Inclusion of ciliary body and vitreous in wound. Treated conservatively. Perforated wound of left cornea below with presentation of iris covered by conjunctiva. Traumatic cataract. Atropine and double bandage.

37. Mrs. R. P. P. Small linear incision made over left lacrimal bone for escape of particle of glass. Moist dressing.

38. Mrs. M. V-shaped wound of cornea with deposit of lymph about edges. Hyphæma. Iris cannot be detected. Edges of wound freed, atropine and bandage.

39. M. D. Opening of conjunctiva over insertion of external rectus muscle for escape of glass particle.

40. L. D. Large perforating wound of right ciliary body above. Globe enucleated.

41. W. A. R. Right eye normal. Large corneo-scleral wound of left eye with prolapse of ciliary body. Enucleation of eyeball.

42. Mrs. W. Left eye completely destroyed. Extensive penetrating necrotic wound of lid. Oil silk inserted in orbit to prevent adhesions of lid to conjunctiva.

43. M. L. Perforated wound of right sclera at temporal side. Incarceration of ciliary body, excised. Perforated wound of left

cornea, prolapse of iris, wound granulating over, traumatic cataract. Atropine and double bandage.

44. Mrs. G. N. Right eye collapsed, panopthalmitis. Necrosis of tissues with œdema of lids. Enucleated, moist dressing.

45. Mrs. S. Both eyes so destroyed that organs cannot be distinguished. Extensive wounds of face and lids. Moist dressings.

46. A. P. Right eye normal. Perforating wound of left cornea 4 m.m. in length opening horizontally toward nasal side of corneo scleral margin. Iridectomy.

47. M. S. Right eye collapsed, enucleated. Left eye shows multiple incised wounds of cornea extending from centre of pupillary area to corneal limbus below. Wound gaping and vitreous presenting. Vitreous excised. Conjunctival flap and bandage.

48. B. C. Vertical incised wound of right cornea. Extends several mm. below the corneo-scleral margin. Wound has already been sutured and is apparently in a healthy condition. Cornea œdematous at temporal side. Atropine and bandage.

We had some exceedingly difficult enucleations where the lids had to be separated by retractors, so intense was the induration with the attendant necrosis of the conjunctiva. Secondary adhesions rendered our progress slow but in no case did we meet with any untoward complications while operating. In one or two cases I practised the Lister operation, separating the muscles and eviscerating the contents of the globe, at the same time excising most of the sclera and leaving only a small curtain of this tissue about the optic nerve. The idea of this procedure is presumably to offset infection backwards into the orbit. The reaction in these cases seemed to be much greater than in the simple enucleations where drainage forward, in my opinion, was better.

It must be remembered that the eye injury was frequently only an associated condition of the most ghastly incised wounds of the head, face and neck. These wounds were invariably caused by glass and could only be described as hideous, they were all too terrible. Much of our time was consequently taken up by attending to these wounds, the fact of dressing the eye being a mere coincidence. Practically every face wound was septic; nay more, each was welling out with a copious purulent discharge while other wounds appeared almost to be gangrenous. An earlier attempt had too often been made to bring the edges of these tears together by sutures, the stitches invariably sloughing out at one side, leaving the adjacent tissue more

necrotic. The faces appeared as though some filthy septic claw or rake had been dragged over the face as deeply as it could penetrate. In cases of retained glass a bloody serum kept being exuded rather than pus, this no doubt being due to the irritation caused by the restrained glass. In many cases it was marvellous how intense had been the injury inflicted upon one lid while the underlying eyeball had not been disturbed. On the other hand it was equally to be wondered at how often an eye was picked out by glass while the lid remained uninjured. I performed iridectomies, excised portions of presenting ciliary bodies in some desperate cases and attempted the repair of certain wounds of the cornea with fair success. In only one instance from my own series of cases did infection ensue. The exception was the case of a child who probably tried to remove her bandage. Any attempt at bacteriology would have been a burlesque. We made the best effort at asepsis that was possible under the circumstances. I could vouch for my instruments and dressings through Miss Etter's care. I could not employ rubber gloves as I abominate them in eye work. Perhaps there is a certain unrecorded virtue in the frequent application of "Queen's Laundry Bar" or some of the other commoner kitchen varieties of soap which seemed to come to my hand oftener than any other. Perhaps it was because I used strong bichloride till my hands began to cut, perhaps it was both; but more probably that because our luck was with us. A word for the conjunctival flap; we made use of it in numbers of cases both in scleral wounds as well as in incised wounds of the cornea and I do not hesitate to affirm that many of our successes were due to our assuming this precaution. Argyrol may have helped in certain cases while atropine was used along general lines as conditions warranted. When possible, all intraocular operations were left undisturbed for two days before I did the first dressing.

To show the wonderful reparative results achieved, I am able to state that Camp Hill Hospital was practically evacuated with the exception of about one hundred cases in ten days' time, the patients generally being transferred to civilian units or to homes organized for their care in some of the smaller neighbouring cities of the province, as Truro, Windsor, New Glasgow, Sydney. We had only twenty remaining in the eye ward, who were cases as a rule waiting for their homes to be reëstablished in Halifax or who were expecting accommodation with relatives or with friends.

In Camp Hill Hospital 1,500 units of anti-tetanic serum was given to each patient but only on the fifth day after the accident,

as a large enough supply could not be obtained at first in the emergency. We did not have a single case of tetanus. One case, I believe, did develop at the Victoria General Hospital, but the condition subsided under treatment, the patient unfortunately dying from a lobar pneumonia. I did not see one case of spreading gangrene although the *B. ærogenes capsulatus* was noted in four cases in another hospital. We further did not have any cases of erysipelas, although I suspected it in one case, the condition shortly subsiding as a false alarm, such to my peace of mind. There was no meningitis at Camp Hill.

Various reports have been circulated regarding the number of those permanently blinded as the result of the accident. My opinion is that most of these reports have been exaggerated although the number is sufficiently appalling. I estimate that five hundred people, or one person in every one hundred and fifty of the population of Halifax will be or should eventually be wearing an artficial eye. Many will not be able to wear an eye for the reason that there has been irreparable damage done to the lids and face as well as to the orbit. About two hundred people will be blind if figures count for anything. I base my figures on the following estimate. The *Halifax Herald* makes the statement that only 3,000 people were injured. If 1,500 were cared for at Camp Hill and if eight other units were doing work to full capacity, this number could be easily doubled, especially if one is to include the number of people who were receiving private attention in their own homes or dressing stations. In my opinion 25 per cent. of the casualties were eye cases, making 1,500. Figures compiled from my own wards show permanent blindness in 10 per cent. of the cases which would mean one hundred and fifty of the total number. This figure will doubtless be augmented to two hundred when late manifestations appear in a single remaining injured eye. There are some questions and problems which will never be answered, or to which history must vouchsafe a reply in the course of time. Were too many eyes removed? I hope not. My time was completely taken up at Camp Hill where I had all that I could attend to. Eye work was done at every other unit or hospital for which I cannot possibly answer. My opinion from my knowledge of the men entrusted with the work is that it was conservatively and conscientiously undertaken and carried out. Most of the enucleating at Camp Hill had been performed by my predecessors, Dr. Cox and Dr. McLennan, although a few choice specimens—probably a dozen—complicated cases were left over for my particular edifi-

cation. From the eyes which I saw remaining and where an honest endeavour had been made at operative repair, I can safely say that no eye was removed at Camp Hill that was not irretrievably lost. One may equally well ask the converse, were any injured eyes left where the site of injury might threaten subsequent sympathetic trouble? Where the other eye was injured, no, where both corneae were incised with iris and ciliary bodies presenting, yes. Our hands were absolutely tied under such circumstances. One had no alternative but to trust to a kindly providence and to hope for the best. The problem which is now confronting the oculists of Halifax is the fate of an eye where a late sympathetic trouble may ensue to an inclusion of the ciliary body or to the retention of a glass particle in the uveal tract. There is material for a book on plastic operations on the lids and face. No author will ever find more material in so short a compass.

One or two observations in conclusion. I would like to testify to the generous and spontaneous response made by the American medical profession and by the American people in general. It was not a response, for in most cases no appeal for help had been made. The act of service was a spontaneous manifestation of a kindly sympathetic people to neighbours in distress. These were generous and appreciative in the broadest sense of the term. I might mention in particular, the Boston unit, the Maine unit, the Providence unit. Each one came prepared to undertake all forms of work on the shortest possible notice. Take the Providence doctors and nurses who left on two hours' notice. They were travelling on Sunday and wanted some Red Cross insignia. No shops could be found open at any of the stations through which they passed. They finally compromised with the porter of the sleeper for a discarded green curtain and an old sheet. The Providence unit will always be remembered with regard in Halifax as the Order of the Green Cross. On their arrival at Halifax every hospital had a complete staff. Providence started in to do a first aid in a systematic manner by visiting all homes about the devastated area where families had bravely attempted to hold together and tabulating such cases as well as attending to the wounded. When one of the hospitals was later evacuated Providence took possession with a full complement of patients ready at hand.

It is useless for me to attempt to acknowledge in proper terms the kindly consideration and hospitality of the people of Halifax, civilian as well as military. All were most keenly sensitive of whatever help we were doing our best to afford. All they had was ours

and their homes were our billets. My social experience was an extremely happy one and in spite of my hard work I actually enjoyed myself.

An outstanding feature, and one which impressed me greatly, was the absolute abstinence from indulgence in alcohol. One may be a fanatic regarding the question from both points of view, another may be uncharitable enough to say that whiskey may always be had and never easier than in a dry town. I did not detect alcohol in the case of a single patient, relative, soldier, or medical officer at a time when indulgence might almost have been condoned with as an only apparent solace in grief and depression.

One of the most remarkable statements which I am able to make is that throughout my service, in the presence of death, of suffering, and following the destruction of all that life and home held for them, I did not see one single tear shed while I was in Halifax. I naturally except the children, where a painful dressing was a sufficient excuse. Were the people as a whole stunned, or did higher ideals seem to be uppermost and the most generous and kindly motives to possess all classes and all natures? Everybody served and served gladly, from the highest to the lowest, and those with minor injuries were happiest when trying to help others with wounds more serious than their own.

And so I have come to the end of my story. As the recital of my surgical experience, necessarily sketchy through the emergency of the situation, it is probably of little value; as the tale of a professional adventure it is possibly of some interest; as the testimony of an endeavour to help a heroic and deserving people, it is no more my own than I feel it to be that of all who have taken the trouble to read of my sojourn in Halifax.

ANALYSIS OF CLINICAL TYPES OF PUERPERAL FEVER WITH SPECIAL REFERENCE TO PROGNOSIS AND TREATMENT

By B. P. Watson, M.D., F.R.C.S.E., F.A.C.S.

Professor of Obstetrics and Gynæcology, University of Toronto; Obstetrician and Gynæcologist, Toronto General Hospital

AND

W. A. Scott, B.A., M.B.

Assistant Demonstrator in Obstetrics and Gynæcology, Demonstrator in Anatomy, University of Toronto; Junior Assistant in Obstetrics and Gynæcology, Toronto General Hospital

THE title of this paper will lead you to expect, we are afraid, something more elaborate than we shall be able to give in the time at our disposal. We propose in a later paper to give a detailed analysis of all cases of infection *post partum* and *post abortum* which have occurred in the obstetrical department of the Toronto General Hospital, and all cases already infected sent in to the gynæcological department from outside during the period from July 1st, 1914, to December 31st, 1916. To-day, however, it will only be possible to outline a few of our deductions and conclusions from that study.

We have taken as our standard of morbidity that laid down by the committee of the British Medical Association, viz., "All fatal cases and all cases in which the temperature exceeds 100° F. on any two of the bi-daily readings from the end of the first to the eighth day after delivery." During the period mentioned, the total deliveries in our wards were 2,096. Of these, 476 or 22·9 per cent. showed a morbidity according to the above standard. These include cases sent in obviously infected, cases of eclampsia, placenta prævia, induction of labour, and the various other operative cases which occur on an active obstetrical service. In addition it should be pointed out that in the Burnside Obstetrical Hospital there are two classes of cases: Those delivered and cared for by the staff, and

Read at the forty-eighth annual meeting of the Canadian Medical Association, June 14th, 1917.

those treated by private practitioners of the city, any one of whom may have access to our semi-private wards. During the same period ninety-seven cases of gross puerperal infection were treated in our gynæcological wards, the patients having been delivered outside the hospital at varying intervals of time prior to admission. Taking then the patients confined in our own hospital, we find that out of the total four hundred and seventy-six showing a morbidity temperature, the following conditions were found:

There were sixteen cases of sloughing tears of the perineum, vagina, or cervix; nine cases of cellulitis; six cases of pus tubes; three cases of phlebitis; two of retained secundines; two of thrombo-phlebitis and bacteræmia; one of pyæmia; four cases of ruptured uterus; one in which the house surgeon left three swabs in the vagina; four cases of active syphilis showing ulcerative lesions; one of Bartholinian abscess; four of eclampsia; two of puerperal insanity; five cases of pyelitis; two of cystitis; one of scarlet fever; one case of pneumonia; two of acute miliary tuberculosis; and one of suppurating ear, giving a total of seventy cases in which at some time or other a demonstrable lesion was discovered. In the other four hundred and six cases no demonstrable lesion ever developed. Two additional points may here be brought out:

1. Of these seventy cases that did develop some demonstrable lesion there were very few in which that lesion manifested itself until after the patient had been running a septic temperature for some time.

2. Of the four hundred and six cases with no demonstrable lesion, over 80 per cent. simply had a slight rise of temperature seldom going beyond 101° and only lasting for a few hours, clearing up spontaneously without any treatment. The rest either ran a higher temperature or had a mild degree of fever lasting for some days.

Let us now compare with this the series admitted to the gynæcological wards from outside. The very reverse is true. Only fourteen of these ninety-seven cases failed to develop some definite anatomical lesion. There were thirty cases of cellulitis, twenty-eight of thrombo-phlebitis and bacteræmia, one of pyæmia, twenty-two of pus tubes, five of retained secundines, three of sloughing tears, two of phlebitis, one of pyelitis, two of pneumonia, two of miliary tuberculosis, and one of appendicitis. It will be noted that some of these cases had more than one type of lesion. It will be seen, therefore, that while the great number of those cases developing fever in our own wards cleared up without ever

being seriously ill or developing any definite anatomical lesion, practically all of those cases sent in with fever from outside did develop such lesions. The explanation of course is that all cases of morbidity turning up outside the hospital never reach our service, but it seems fair to presume that the proportion will be as great, if not greater, than that in our own wards. We would also call attention to the great variety of different lesions which may develop in patients who show fever during the puerperium. We believe in the active treatment of any of these lesions when it is obviously indicated, but the point that has been impressed upon us by this study is the inadvisability of any active treatment until such lesions and such indications are present. Any active routine obstetrical treatment instituted early in the course of fever would have led to that treatment being carried out in such diverse lesions as pus tubes, tuberculosis, suppurating ears, scarlet fever and bacteræmia, not to mention the fact that that same treatment would also have been administered to four hundred and twenty patients who never developed any anatomical abnormality.

The day of the puerperium on which the patient developed her fever is also instructive. In the case of cellulitis the average day for the fever to develop was the fifth, and of those developing before this time the majority were due to criminal abortions. The fever in the case of pus tubes usually began about the tenth day, if the lesion followed labour. In the case of abortions it developed much earlier, the average being on the second day. Thrombophlebitis also showed an early rise of temperature, usually about the second day. The same is true of those cases which showed no lesion, although an occasional case late in the puerperium would have a sudden rise of temperature lasting for a few hours but quickly dropping to normal and causing no future disability. These facts we also feel show the inadvisability of instituting any active treatment before definite lesions are developed. Those cases in which fever develops early we have found usually have no lesion, in which case they will clear up quickly, or are the thrombo-phlebitic or bacteræmic types where operative procedures are going to do no good and will likely do much harm.

Our routine method of investigation of cases developing fever in the puerperium, is to make a general examination of the patient to find if there is any possible cause for the fever extragenitally. The patient's mouth, throat, lungs, and heart are investigated, the urine is examined for pus and the kidneys palpated for tenderness, blood count and blood cultures are taken. The

uterus is palpated through the abdomen, its size, mobility and tenderness noted. No vaginal examination is made at first. We have ceased to take swabs from the interior of the uterus for bacteriological examination. If the perineum has been torn and stitched, it is inspected, and if red or inflamed looking the stitches are removed. Our reasons for abstinence from further pelvic examination are:

1. We find in 85 per cent. of cases which have some fever in the puerperium that the fever subsides in a short time and the patients never develop any demonstrable pathological lesion.

2. Pelvic examination very seldom reveals anything definite until the fever has been present for some little time.

3. Pelvic manipulation, specially if carried out roughly may convert what was at first a mild local infection into a more virulent pelvic inflammation or into a general bacteræmia.

Our abstention from local pelvic examination in the early stages implies likewise abstention from any local treatment. We believe we have got better results by the abolition of the routine vaginal or intra-uterine douche in cases of fever in the puerperium.

The great lesson which the figures which we have quoted seems to teach is that in cases of fever in the puerperium, recovery will take place without any bad effects in the vast majority, viz: 85 per cent. of the cases. In the remaining 15 per cent. the pelvic conditions that are present accounting for the fever may be infection of perineal, vaginal, or cervical tears, pelvic cellulitis, pus tubes, thrombo-phlebitis, or bacteræmia. All of those conditions result from the implantation of organisms into some part of the genital track from without, or their settlement there after having gained access to the blood through some extra-genital source. In the case of sloughing tears of the perineum or vagina, the infection can undoubtedly be limited and controlled by the removal of sutures, with the free opening up of the wound. Where the infection is in the uterine cavity, drainage is free and can be aided by posturing the patient.

An intra-uterine douche, the finger, or a curette, can never remove all the organisms or all of the infected tissue from the interior of the uterus, and all of these agencies may do much harm by opening up lymphatic channels and blood vessels to the invading organisms and so converting a local into a general infection.

We recall one case four years ago where we used a dull curette very gently in such an infected uterus. Prior to this being done repeated blood cultures had been negative. Twenty-four hours after the operative interference streptococcus was demonstrated in the

blood and the patient died two days later. We have seen a great number of cases admitted to our gynæcological wards with extensive cellulitis, where a curettement had been done by the outside physician. In a number of cases of bacteræmia admitted there was a similar history of operative interference.

Of the patients delivered in the hospital and under our care from the beginning, in whom the policy of non-interference was carried out, we had only nine cases of cellulitis, two of bacteræmia, and six of pus tubes. In the ninety-seven cases admitted from outside, in a very large number of which there had been intrauterine manipulation carried out subsequent to the rise of temperature, there were thirty cases of cellulitis, twenty-eight of thrombo-phlebitis and bacteræmia, and twenty-two of pus tubes. In those latter cases of course we have no record of the total morbidity with which to compare them, but the figures given are significant.

Conclusions

1. That in the great majority of cases, viz., 85 per cent., developing fever in the puerperium the fever quickly subsides without any definite pathological lesion developing.

2. When a definite pathological lesion does develop it does not manifest itself for some little time after the first rise of temperature.

3. When a definite pathological lesion is present in the pelvis the infection starts as a wound infection of some part of the genital tract, namely:

(a) An ulcer of the perineum, vagina or cervix,
(b) Infection around sutures,
(c) Infection of retained secundines,
(d) A localized infection of the interior of the uterus, in which case it will likely be at the placental site.
(e) Or it may be a primary blood infection, in which case it is of the autogenous type.

4. The primary infection may remain localized for varying lengths of time or it may spread by:

(1) Continuity of tissue,
(2) The blood stream,
(3) The lymphatics,

and it may spread in any of these ways from any given primary focus. For instance we may get a pelvic cellulitis from an infected perineal suture, from a torn cervix, or from an infection of the placental site.

5. The lesions arising from the spread of infection by continuity of tissues are usually either pus tubes, pelvic peritonitis, or a general peritonitis. Any of these conditions may arise from various organisms, but the two commonest are the gonococcus and streptococcus, and they usually present different clinical pictures. The lesions due to the gonococcus are ordinarily developed late in the puerperium, especially if the infection has followed labour, whereas with the streptococcus we find that the initial symptoms appear earlier and the prognosis is graver.

6. Infection spreading by the blood stream is usually of the thrombo-phlebitis type, which ordinarily begins in the thrombosed veins of the placental site, though it may occasionally arise from primary infection in the perineum or vagina. The terminal results are localized abscesses in the wall of the uterus, pyæmia, or septicæmia. We had one case in which apparently the septic process broke through the wall of the vein late in the disease and gave origin to a widespread cellulitis which suppurated four months after the primary rise of fever, the patient recovering after the abscess had been opened.

7. Infections spread by the lymphatics in most instances give rise either to a cellulitis or to septicæmia. In the case of cellulitis, the original focus is usually in the cervix or the uterus, though it may arise in the vagina or perineum. The lymphatic type of septicæmia is the most serious of any of the puerperal infections arising early, leaving no local lesions and ending in the death of the patient in most instances.

8. It is our opinion that the type of organism is not of as much importance as the situation in which that organism is growing, that is, as the anatomical lesion. For instance, one may get a fatal bacteræmia as well as pus tubes due to the gonococcus, or a cellulitis or a thrombo-phlebitis as readily as the so-called sapræmia in the case of the streptococcus.

9. We have at present no means of treating primary infection in the uterus which does not at the same time favour extension of the inflammatory process of the surrounding tissues or the blood stream.

10. Therefore, all cases should be treated expectantly during the early stages.

11. When a definite pelvic lesion does develop it should be dealt with along the lines of established procedures.

12. The pathological process of puerperal fever is the same whether the sepsis follows labour or abortion.

THE ESSENTIALS OF SUCCESS IN PROSTATIC SURGERY

By Ernest M. Watson, A.M., M.D.

Buffalo, New York

THE gratifying reduction in the mortality following prostatectomy during the last ten years, in the hands of those making a study of urinary obstruction, has been keenly appreciated. At the present time in some clinics[1] it is less than 4 per cent. in hundreds of operations covering a period of several years. One naturally inquires what has been the cause of this success, and what new light has been shed on a formerly rather discouraging field of operative surgery. Operative technic, it is true, has greatly improved, but perhaps the greatest factor in making prostatectomy an operation of choice rather than an experience with uncertainty has been the careful study of the individual patient, and the determination of his physical index by the more modern clinical and laboratory methods.

1. The correct diagnosis of the nature of the obstruction is still, as always, one of the first steps in the proper handling of these cases for without this future intelligent management is severely handicapped, if not impossible. 2. Of paramount importance, and carrying the greatest responsibility for the surgeon, is the determination of the exact physical status of each patient individually. Upon this, supplemented by the appropriate preparatory treatment, depends in the greatest measure the success or failure of the operation. 3. Directly associated with the preceding, and at its culmination arising from it is the selection of the proper time for operation. To answer this the judgement of experience is necessary, together with the ability to interpret correctly the clinical and laboratory findings. 4. Following this the choice of operation must be made. This too, is a matter of judgement in which the type of obstruction, the condition of the patient and the familiarity of the surgeon with any given method all play an important rôle. 5. Lastly the operative aftercare must be considered with the ability to recognize compli-

cations and to handle them in a manner that assures the patient the greatest comfort and ultimate success.

In the diagnosis of prostatic hypertrophy there are two accepted methods of procedure, first rectal examination which will reveal the amount of hypertrophy pushing backward into the rectum. In this way can be noted the size, shape, outline and consistency of the prostate. Also the amount and character of the induration and adhesions present can be felt, whether the median furrow has been obliterated, and the nature of the notch above the prostate. This study enables one to differentiate with great accuracy between a simple benign hypertrophy and a carcinomatous induration. In addition the size and character of the seminal vesicles can be determined with the presence of induration and adhesions if any, and too, the condition of the posterior bladder wall between the vesicles. The presence or absence of palpable pelvic glands should also be noted, for these are of considerable importance in cases with suspicious areas of induration. The presence of blood should also be looked for on the examining finger, and finally a note made on the condition of the rectal sphincter. The relaxation of the sphincter, with only a small amount of prostatic hypertrophy, in conditions of urinary obstruction is often the suggestive point in suspecting a tabetic bladder, which possibility always has to be borne in mind.

Supplementing the rectal palpation there should be a cystoscopic examination to determine the amount of residual urine and particularly to observe the position and type of the intravesical prostatic hypertrophy. The rectal findings cast no light on the character of the intra-vesical enlargement and this is a highly important matter. The hypertrophy, intravesically, may involve the middle or lateral lobes, the Albarran group of glands or the sub-trigonal group singly or in various combinations. Very rarely is the anterior lobe involved. There may be no actual lobe formation but rather a "bar formation" in the medium portion, or occasionally a circular or ring shaped hypertrophy in the form of a "collar" about the vesical orifice. The determination of the exact type of prostatic obstruction is imperative for a correct handling of the case at operation.

Every prostatic presents an individual problem in the matter of ascertaining his physical preparedness for operation. Most of these men have had obstruction to urination for some time with a certain amount of damage to the kidneys from back pressure of varying extent. As an index of renal impairment the phenol

sulphone phthalein test is the best means of study we have at the present time. After relieving residual urine by catheterization, phthalein tests should be done twice a week in order to have an interval record of the exact working capacity of the kidneys. The treatment for these cases should be the forcing, of water i.e., from two and one half to three litres in twenty-four hours, with courses of urotropin (15 grs. three times a day), and the relief of the residual urine by interval catheterization or by the inlying retention catheter. With a phthalein output of much less than 30 per cent. the first hour, this preparatory treatment is indicated. Particularly is this true if there has been much residual urine, i.e. 400–500 c.c. After the first phthalein test there is frequently a fall in the phthalein output but in a few days the recovery of the kidney function is evidenced by a definite rise in the output until a period of stability is reached. This in some instances may be several times the output on admission.

As additional data in individuals presenting a very low phthalein output, even without signs of acidosis, information obtained from the determination of the blood urea (Marshall's method)[2] is extremely valuable. When the urea content is much above 3·5 or 4 grams per liter there is definite retention of waste products. Cases with a blood urea of over one gram per liter or about three times normal, by the above methods can usually be prepared for operation in several weeks. In impending acidosis the determination of the hydrogen ion concentration of the blood and the carbon dioxide content of the alveolar air give valuable supplementary data as to the exact condition of the patient in terms of almost methematical certainty. In this condition free catharsis, with sodium bicarbonate by mouth, and at times infusions of glucose (5–10 per cent. solutions), with occasionally lactose per rectum (one and one-half ounces to 500 c.c. of fluid) is of inestimable value. Aside from the effects of urinary back pressure these individuals not infrequently have other lesions which preclude immediate operation, namely various infections of the urinary tract, cardiac disease, cardio-renal involvement and arterial hypertension. Each of these conditions in turn deserves its own special consideration and treatment and for no patient can a stereotyped form of preparation be laid down. The success in prostatectomy comes not always to the operator who is most dexterous in his technical manipulations, though this is important, but to him who makes use of the newer methods in studying his patients and is able to interpret correctly the clinical and laboratory signs of preparedness.

When to operate is a question that has to be answered separately for each patient. In cases of urinary back pressure a plane of renal stability must be reached as shown by a constant level of the phthalein tests. Cases with a function much below 30 per cent. the first hour should be given the advantage of drainage to improve the output. With urinary infection and possible pyelitis or pyelo-nephritis no patient running a temperature should be operated upon. Epididymitis, a not uncommon concurrence, should contraindicate immediate prostatectomy. Evidences of a lack of cardiac compensation or a pronounced cardio-renal involvement should deter operative interference until a time when the risk is reduced to a minimum. Hypertension with a blood pressure running over 200 mm. should be regarded with hesitation. It is possible for these patients to undergo a radical cure successfully but careful rest in bed with continuous drainage is essential. Many individuals, after fifty, have a certain amount of glycosuria and this immediately brings up another phase of operative risks which demands careful study and adjustment before one is justified in attempting any surgical procedure.

The choice of operation depends largely upon the type of prostatic obstruction. To one unfamiliar with the perineum, however, the suprapubic route will probably give better results. But from the unbiased reports of various operators[3] this method is unquestionably followed by a greater mortality. This is due to several factors of which may be mentioned greater surgical shock, more frequent hæmorrhage, greater danger from sepsis due in considerable measure to infection in the space of Retzius, less perfect if not poor drainage and a longer period in bed, i.e. ten days to two weeks. The perineal route of approach in properly trained hands undoubtedly gives a lower mortality. In a series reported by Young[4] some years ago he had one hundred and twenty-eight consecutive cases without a death. More recently[5] from his clinic for one year (January, 1915—January, 1916) are reported ninety-four consecutive cases (ninety perineal and four suprapubic) with one death and that individual ninety-three years of age who died on the thirteenth day after operation of cerebral thrombosis. This case the writer personally had the care of and can state that the patient was up in a chair and walking about the ward for several days before his thrombosis. For the older men, particularly, the perineal method is the approach which gives them less shock and there is practically never any abdominal distention following it. There is less danger of secondary bleed-

ing for the disturbing vessels can be ligated readily at operation and when necessary, which is rare, subsequent packing can be easily carried out. The drainage is dependent and there is no annoying abdominal wound. Patients are out of bed on the third day after operation. Certain pedunculated lobes and others that cystoscopically show considerable enlargement within the bladder are unquestionably easier removed supra-pubically, but through the perineum they can be enucleated and careful exploration of the vesical orifice with the finger afterward will tell the operator whether he has the entire obstruction removed so that there never should be any error in this regard. Perineal prostatectomy is without doubt a more difficult operation for the surgeon but is easier for the patient both at operation and during his convalescence.

In prostatic obstruction with no enlargement as in the so-called "medium bar" cases or even those of "collar" formation about the vesical orifice a prostatectomy is not indicated, nor is it necessary. The punch operation[6] will relieve these conditions even when there has been complete urinary retention. This procedure done under novocaine, entirely through the urethra, necessitates remaining in bed only two days and allows a patient to leave the hospital in less than a week. It requires, however, an application to the suitable cases only, which can be determined solely on careful cystoscopic examination.

In cases of real intra-vesical hypertrophy with grave cardiac or other complicating factors such as marked hypertension or severe glycosuria, which conditions absolutely contraindicate any radical operation there is still a procedure which will relieve their obstruction. This is the application of radium within the urethra to the hypertrophied lobes by certain special instruments over a period of time. The action of the radium causes a shrivelling or contraction of the projecting masses to a degree that finally permits the successful employment of the punch operation to complete the removal of the obstruction. The details of this procedure with a case instance has recently been reported by Young.[7] The writer had the opportunity of caring for the case cited above during his entire treatment which extended over a period of nearly a year and cannot attest too strongly of the success of the above management in certain desperate cases.

Of the complications following prostatectomy by the perineal method they are relatively few. Secondary hæmorrhage is rare. It usually occurs after the removal of the perineal drains and

continued pressure on the perineum is often sufficient to control it; if not, repacking the perineal wound is easily accomplished. If the bleeding is intra-vesical a large Coude catheter (No. 30F.) introduced through the urethra and morphia to keep the patient quiet is practically all that is necessary. Rarely a few days after the removal of the gauze drains a moderate intra-vesical hæmorrhage may occur, this too is controlled by the insertion of a large catheter through the urethra and the use of sedatives. Occasionally an acute retention due to spasmodic contracture of the internal sphincter and vesical orifice or the lodging of a blood clot in the urethra may occur, this in turn is readily overcome by the insertion of a large catheter through the urethra into the bladder. An epididymitis sometimes occurs but this is usually not annoying and support to the scrotum with hot applications, and in the more painful cases the use of lead and opium compresses, controls the situation. Practically never does this go on to abscess formation which requires opening. Infection of the wound is also very rare; when it does occur the cutting of the skin stitches with the opening of the wound followed by antiseptic irrigations suffices. Thrombosis of varying extent occasionally happens and when it does absolute quiet is the essential treatment with such symptomatic management as is indicated.

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THE ESTABLISHMENT OF A FEDERAL BUREAU OF HEALTH

By J. B. Black, M.D.

Windsor, N.S.

IN moving this resolution, I am convinced that the introduction of a speech or essay on thesis on the merits and benefits of a federal bureau of public health, before this meeting, made up of medical men so well informed on the subject, would be largely out of place. Where there is neither lack of knowledge nor indifference, to plead the cause would be superfluous. Little need be said beyond endorsing the resolution, of which I am sure, all approve. It may surprise some of you to know, that for some years after Confederation, there was a federal bureau of public health, under the Department of Agriculture; and the late Dr. Tache was the secretary.

By an Act passed early in 1868, it was declared that "The administration of the subject of public health is joint between the Dominion and the Provinces in virtue of the Act of Confederation.

Preventive medicine was in its early infancy when the British North America Act was framed, and its provisions largely referred to the prevention of the introduction from other countries of contagious diseases, and the care of the insane. There seems to have been no apprehension of the ability to prevent the many diseases originating in the country. Even at that, the Dominion government seems to have appreciated its responsibility in regard to public health. From 1868 to 1872, a federal bureau of public health was maintained by the government. What small amount of attention is now paid to public health by the federal government, is strangely divided between the Department of Marine and Fisheries, the Department of the Interior, the Department of Agriculture and the Department of Inland Revenue. Latterly it has been still further subdivided between the Conservation Commission and the Society for the Prevention of Tuberculosis. And again the care of tuberculosis is divided between this latter and the Conservation Com-

Read at the forty-eight annual meeting of the Canadian Medical Association, June 14th, 1917.

mission. Then there is the National Council of Health under the Conservation Commission which has been granted power to advise federal and provincial governments in matters pertaining to public health. Here, certainly, many cooks have bedeviled the broth. If union is strength, the converse is also true: in division, there is weakness.

Our provincial governments have done splendid work for the prevention of diseases but their work can only be provincial. They cannot reach where federal authority could, and should. And in some provinces the available funds are not equal to the commendable desires of the department.

I need not emphasize here what a stimulus, what an incentive and example, and above all, what great assistance a federal bureau would be to the several provincial boards, not in money grants, but in departments where the province has no control: the estabishment of a much needed national laboratory can only be accomplished by federal authority (and I regret to say that the Order-in-Council, 1911, to establish a laboratory, has never been carried out). The prevention of the polution of international and interprovincial waters. The sanitary supervision of international and interprovincial passenger travel by land and water: that railway sleeping cars and steamer state-rooms may no longer be a menace to public health. The greatly needed better control of venereal diseases, tuberculosis, typhoid, and other infectious and contagious diseases. The education of the people by press and platform in sanitary matters! But it is a waste of time of this well informed association to enlarge on the activities awaiting a federal bureau of health, in this great field already ripe for the harvest. The pressing needs of a federal bureau of health are now greater than ever. It is a war measure of first importance. Extra and unusual measures must be taken to make good to Canada the enormous loss of our young men in this war. Thousands of our boys have fallen in France and Flanders—a necessary and voluntary sacrifice in the cause of liberty and humanity, while thousands of those needed to take their place in civil life after the war are allowed to die needlessly, in the cause of nothing but ignorance and neglect.

Thousands of children are dying every summer in the cities all over this Dominion who could be saved, who should be saved to the nation with organized and intelligent endeavour. It is the consensus of the judgement of men in position to know who have studied this question, that 50 per cent. of deaths in early childhood can be prevented, and 33 per cent. of adults under seventy years of age.

When Straus established his pure milk depots all over New York City, infant mortality there dropped 50 per cent. inside of two years.

We have imported at great expense, people from every misgoverned country in Europe—many of them unfit for Canadian citizenship, in order to swell our population, and at the same time we have let our own die for want of intelligent care and protection.

Our federal government has given much care—and commendably so—to the health of hogs, cattle, and sheep (about half a million dollars annually). It has equipped a fine laboratory, with a large staff of veterinary surgeons for this purpose. But how little for young children, young men and young women who mean so much in the development of this young nation. If we need more wheat, more potatoes now, do we not need more live babies and fewer dead ones in Canada?

Evidently the important question propounded centuries ago in Oriental literature: "How much better then is a man than a sheep?" has not been pondered or answered by our federal governments.

China or India might stand unmoved at an infant death rate such as ours, but here it is deplorable, almost criminal.

At the present time college men and educationists are giving addresses on the necessity of introducing science and the establishing of laboratories for scientific research, in connexion with our factories and industrial pursuits, in order that we may compete with Germany and other countries, and to attain and hold our place in the sun as a manufacturing country. We are also beginning to adopt rational and intelligent and organized efforts to conserve our national resources; yet nobody but the few are urging scientific methods to prevent the loss of our population by death, to conserve the lives of our people, and intelligently to reduce sickness, suffering and premature death.

The most important subject for consideration by the government is relegated to the most obscure place. If it be true as an authority has stated, that "No public expenditure can be as rewarding as well directed expenditure on the public health", then we ask with all assurance the government's earnest consideration of a federal bureau of health, a bureau not tacked on to agriculture or marine and fisheries or any assocation or commission, but a bureau separate and apart from any other. A department demanding the best brain and energy in the medical profession of Canada.

Case Reports

TWO CASES OF SINUS THROMBOSIS AND JUGULAR RESECTION

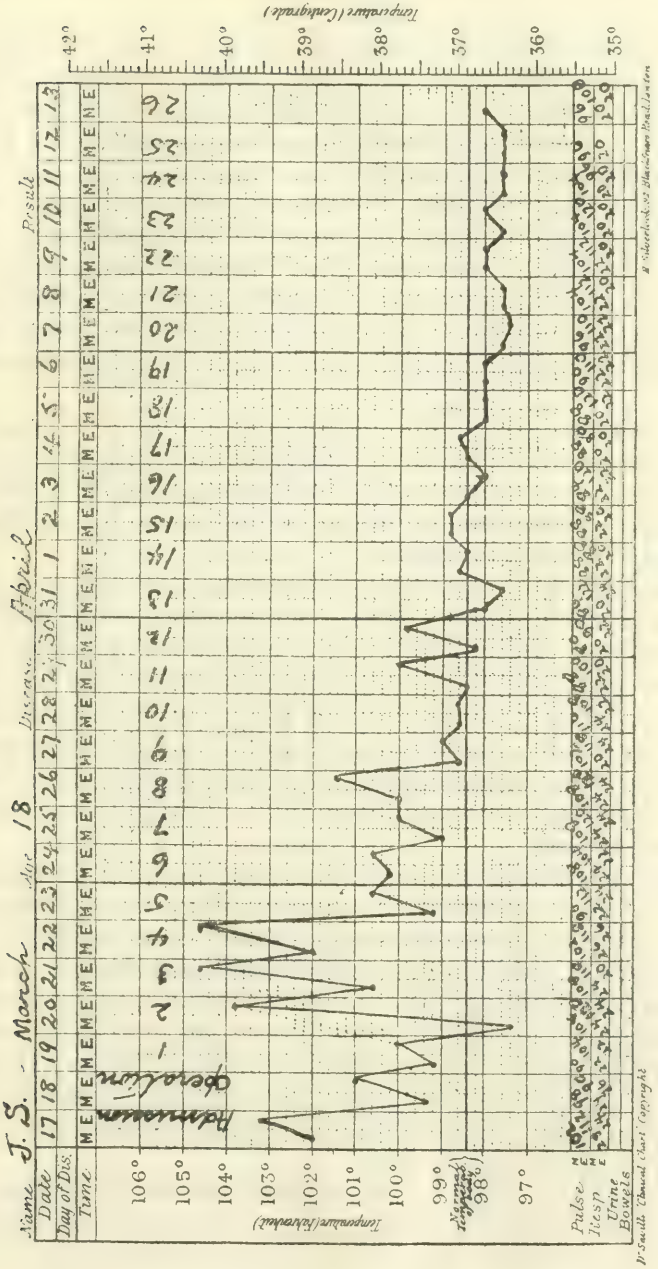
By R. S. Minnes, M.D.

Ottawa

WHEN I was kindly asked by our chairman to give a paper at this meeting of the Canadian Medical Association, I promised to give some case reports and later on, receiving a request for a title, it happened that I had under my care two cases of infective sinus thrombosis which were of interest to me and I beg to present them briefly. The two patients were sent to me on the same day from out of town suffering from acute ear trouble following measles, and both rapidly developed symptoms of infective sinus thrombosis.

Case 1. James S., age eighteen, was referred to me by Dr. S. H. Murphy, of Renfrew, on March 17th 1917. On February 12th he had an attack of measles and was in military hospital three weeks. There or four days after leaving the hospital the right ear ached with a cold and he was sent again to hospital. A week later the ear broke and discharged, and it continued to run until he came under my care, profusely at first and very little for a few days later. The ear continued to ache all the time and the mastoid was tender from the beginning. On the evening of March 16th he was very sick and the temperature rose to 105° without a chill. He was then sent to me.

When I first saw him, temperature was 103·1°, the right ear was discharging, glands of the neck were swollen, the mastoid was very tender but no swelling, and the patient was drowsy. There was marked bulging of the posterior segment of the drum. The drum was freely incised under a general anæsthetic and hot irrigations of the meatus and ice bag to the mastoid used. Twenty-four hours later the temperature had gradually fallen to normal and he expressed himself as feeling very well. Two hours later as I was about to leave the hospital a message was brought me that he was having a chill and the temperature rose to 101°. I de-


Name J. S. - March
Date
Day of Dis.
Time
Temperature (Fahrenheit)
Temperature (Centigrade)
Pulse
Resp
Urine
Bowels
Abdominal operation
Typhoid

cided to operate without delay and did so with Dr. Mahood's assistance.

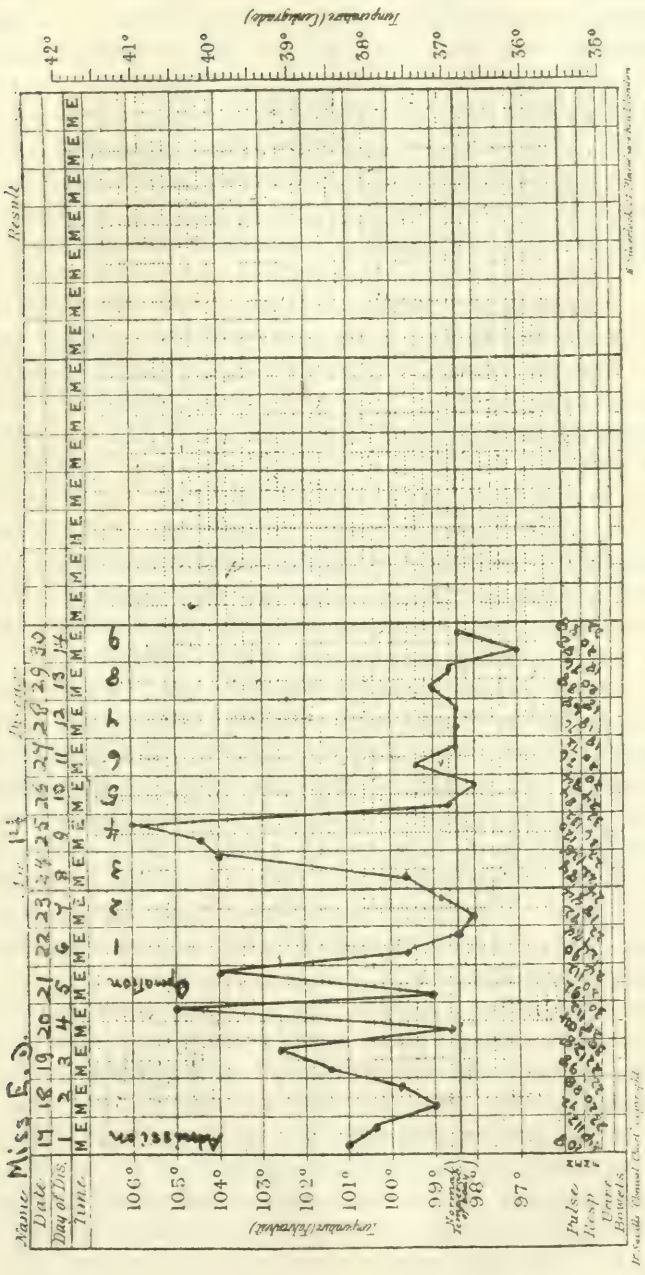
On opening the mastoid I found it extensively involved, much free pus and a perisinous abscess. The sinus-wall was dark and far from healthy looking and after exposing the sinus freely I opened it. A well organized clot completely obstructed it and no bleeding resulted. The jugular vein was then tied off well down in the neck and the vein dissected to well above the temporo-facial branch and the wound was closed after putting in a gauze drain. The lateral sinus was then followed back nearly to the torcular herophili and well down to the bulb before bleeding was obtained. The sinus walls were removed, the wound packed, an intravenous saline injection given and the patient returned to bed.

On March 19th the temperature fell to 97° at 4 p.m., rising to 100° at 12 p.m. On March 20th the temperature rose to 104° at 10 p.m. It continued high for several days but with daily dressings and intravenous salines it fell to 99·3,° on the 23rd, when they were discontinued.

Recovery from this on was uneventful except for a slight phlebitis in the leg which appeared on April 6th. The neck wound closed without suppuration and on April 24th the large exposed area over the mastoid and occipital region was closed by a plastic operation. A very small sinus at its posterior end still remains and the mastoid cavity has nearly granulated up. The posterior wound was very extensive as the sinus had to be followed back to within an inch of the torcular herophili. The infection was streptococcus pyogenes.

Case 2. Eva D., age fourteen, was referred to me by Dr. W. W. Buttle, of Kinburn, on March 17th. She was taken sick with measles on March 3rd, and on March 10th she had a severe ear-ache in the right ear. The drum broke and the ear discharged freely next morning giving her relief. On March 13th she had pain behind the ear and some swelling with temperature of 101°, while the ear continued to discharge very profusely. Hot applications of iodine were used but her condition continued about the same, except for an increased mastoid tenderness and she was sent to me on March 17th.

On admission to hospital temperature was 101·2°, pulse 108, mastoid very tender, and there was very profuse purulent discharge from the right ear. The drum was freely incised under a general anæsthetic and hot boracic irrigations of meatus and ice


Name Miss E. D.
Date
Day of Dis.
Time
Admission
Operation
Result
Temperature (Centigrade)
Temperature (Fahrenheit)
Pulse
Resp
Urine
Bowels

bag to mastoid employed. The temperature fell to 99·2° at midnight and the next day the maximum was 99·4°. On March 19th the discharge was still very profuse, temperature rose to 103°, mastoid very tender and operation was decided on.

The mastoid was firm and large with large pneumatic cells filled with a sticky mucoid secretion and extending far back and into the tip, the streptococcus mucosus capsulatus infection. The sinus was far back and as its covering was healthy it was not disturbed but the bony wall of the whole sigmoid sinus was laid bare.

The temperature remained high, viz., 102·3° at midnight and the following day at noon rose to 104·3°, falling to 98·3° at 4 p.m. Shortly after she complained of feeling chilly and the temperature rose to 105·1°, pulse 112 at midnight.

On March 21st she was restless and vomited and the temperature after falling to 99°, rose to 105° at 6 p.m. Assisted by Dr. Mahood, I uncovered and opened the sinus with free bleeding from both ends, then, feeling satisfied that the infection came from the bulb, I resected the jugular, closed the wound in the neck except for a cigarette drain, completed the treatment of the sinus and mastoid, gave an intravenous saline and returned the patient to bed, ordering rectal stimulation every four hours.

The temperature after operation was 106·3° by rectum, but it fell to 98° at 2 p.m. and remained down until the following afternoon at 4 p.m., when it rose to 104°, the general condition keeping good. It continued high the following day, March 25th, and at 10.30 p.m. was 106°, pulse 132, accompanied by a slight chill, falling the next day, March 26th, to 98·3°, when I opened the wound in the neck and found the same sticky pus present as in the mastoid. The neck was cleaned and left open and moist dressings applied; also 10 c.c. of anti-streptococcus serum was given hypodermically.

From this time on the temperature remained practically normal and the patient made a rapid recovery. The neck wound was closed again under an anæsthetic on April 9th and very little scar resulted. The patient was discharged on April 21st. I saw her on May 30th, and the mastoid wound was epidermized.

This second case was of special interest to me because of a similar case some three years ago which resulted fatally. It was the same rapid severe infection, jumping from cell to cell, skipping several, but reappearing beyond and extending to the most extreme confines of the cellular bone, the cells being filled

with the sticky muco-pus of the streptococcus mucosus capsulatus. In this case at a second operation, I opened the sinus because of a chill and rise of temperature to 105°, but with very free bleeding from both ends, I desisted, after consultation, from tying off the jugular. Each day afterward regularly came the chill and rise of temperature to 105°. Blood culture gave streptococci but the serum prepared was ineffectual in averting a fatal termination.

It is possible that this case was one of septicæmia developing from the mastoid bone without involvement of the sinus or jugular bulb, but I am inclined to regard it as due to a parietal non-obstructive clot in the bulb and for this reason I had no hesitation in resecting the jugular vein in Case 2. Kerrison in his valuable work on "Diseases of the Ear" says: "When we have assumed the responsibility of opening a sinus on account of symptoms of septic absorption, we should in every case further safeguard the patient by ligation or resection of the jugular vein," and I think this is a safe principle to follow.

In a recent paper, Dr. Holinger, of Chicago, advocates the principle of non-interference with the sinus and jugular vein in these acute cases. He holds that after carefully removing surrounding infected material and tissue such as pus and diseased bone, with the least possible disturbance to the sinus, nature will in most cases do the rest. He says: "Experimenters agree that sinus thrombosis has a very great tendency toward healing if we only succeed in keeping reinfections (perisinual accumulations of pus) away. The blood current will get rid of the thrombosis, sterilize, organize and absorb if we only take care that the endothelium is not lacerated." Koerner, he says, "showed that the mortality after ligation of the jugular vein is not less than we thought"; also "Sneider had without ligation one death in thirteen operated cases or 92·03 per cent. of recoveries," and "Sneider drew the conclusion that ligature of the jugular is superfluous and worthless in almost all cases of acute suppuration". Ligature of the jugular is reserved for very old cases with extensive metastatic abscesses.

My own experience, a very limited one of about nine cases, leads me to the opposite view. Early operation on the sinus and jugular as soon as the diagnosis is made and before the system gets flooded with septic material usually results favourably.

Of these nine cases one was too septic when sent to me to hope for a favourable result; another was a case of long standing with collapsed jugular and very extensive involvement of the petrosal

sinuses as well as the lateral sinus so that practically no flow of blood could be obtained; another was the case referred to in which I did not remove or ligate the jugular. The other six cases were recent cases and all did well after operation.

MERCURY POISONING WITH ANAPHYLACTIC PHENOMENA AND FATAL ISSUE FIFTY-TWO DAYS LATER

By

A. Rocke Robertson, *Captain C.A.M.C.*, Officer in Charge Medical Division

and

A. Grant Fleming, *Captain C.A.M.C.*, Officer in Charge Laboratories

The Duchess of Connaught Canadian Red Cross Hospital, Cliveden, Taplow, Bucks

WHEN poisoning with corrosive sublimate taken by mouth ends fatally, death occurs either rapidly or it may be delayed for several or many days, apparently depending upon the amount of the poison absorbed. Aitchison Robertson states that the most rapidly fatal issue recorded in the literature resulted in one-half hour, and Whitthaus gives twenty-five days as the longest recorded period in the so-called delayed cases. It is usual, though, for a rapidly fatal case to terminate in about six or eight hours, and the delayed cases seldom survive the same number of days.

In rapid cases the drug appears also to produce severe shock, for in a case recorded by Paccinotti, death ensued "promptly" upon irrigation of a ruptured uterus. A case which one of us (A.R.R.) autopsied some years ago, can hardly be explained otherwise, as death ensued in about ten minutes.

A healthy girl of eighteen left her parents down stairs to go to her room above. Presently they heard a heavy thud and a moment

Received for publication September 1st, 1917.

later found the girl seated on the floor leaning against a bed-post, very pale and breathing with difficulty. They placed her on the bed and, according to their statements, breathing ceased in about ten minutes. At autopsy, bichloride of mercury was found in the stomach contents. The outstanding anatomical feature was venous engorgement of the splanchnic vessels and intense hyperæmia of the kidneys, especially of the capillary tufts.

In another case which one of us (A.R.R.) autopsied, in which death took place five hours after the poison was administered, there was probably a combination of shock and toxic activity of the causative agent.

A pregnant woman, of twenty-five, was obliged to have the uterus emptied on account of pernicious vomiting. The uterus was afterwards washed out with a strong solution of corrosive sublimate. Upon coming out of the anæsthetic the abdomen was rigid and very tender. She was very pale, the pulse rapid and small. In this condition death ensued in about five hours. At autopsy, a hole was found in the fundus, caused by the currette, and bichloride solution was found in the peritoneal cavity. There was intense injection of the splanchnic vessels, and the kidneys, in addition to hyperæmia, showed marked cloudy swelling of the epithelium of the convoluted tubules.

The case which we now report, in which the patient survived the poisoning for fifty-two days, is of much interest in that the longest period of survival hitherto recorded, according to Whitthaus, is twenty-five days. An attempt is also made to correlate careful clinical observations with gross microscopic findings post mortem, in the kidneys in particular, where one is now able to estimate fairly accurately what would have been the ultimate picture had the patient survived. In addition to this, the sudden onset on the thirteenth day of fever, chill and rash, which we interpret as an anaphylactic phenomenon, due to absorption of a large amount of protein altered by the poison, is of considerable interest.

J. G., age twenty-nine, has been brought up on a farm and has never had any previous severe illness. There is nothing of note in his family history. He enlisted in good health, in July, 1916, and shortly after contracted a severe cold with a bad cough, from the latter of which he entirely recovered. On October 15th he reached France and was able to carry on very well until December 1st, when he again got bronchitis. Two weeks later he reported sick but on examination there were no physical signs other than those of a severe bronchitis. The cough was unusually severe;

the sputum, abundant and muco-purulent, contained no tubercle bacilli. Two weeks later the bronchitis had almost completely subsided and the cough had also much abated. A week later he got mumps, bilateral, and seven days later the left testicle became swollen and tender.

Three days after this, in mistake for five-grain tablets of aspirin, prescribed for headache, an orderly gave him two 7-3/10 grain tablets of corrosive sublimate which the patient first placed on his tongue and immediately swallowed with a mouthful of water. He noticed that the tablets immediately began to disolve on the tongue yielding a metallic taste, and after swallowing, he mentioned this fact to the orderly. The latter, realizing that he had made some mistake, summoned help at once. In about five minutes an emetic of mustard water was given, the patient having meanwhile voluntarily though ineffectually tried to vomit. He had felt only a slightly burning sensation in the stomach. Emesis was profuse following the mustard water. A few minutes later a concentrated solution of salt water was also given which produced more vomiting. Then the whites of two eggs were given and within half an hour a stomach tube was passed and the stomach thoroughly lavaged with warm albumin water. Following this, the patient felt only nausea with a mild burning sensation in the epigastrium.

During the following twenty-four hours, there was only a moderate amount of epigastric discomfort, a sense of warmth rather than of burning, with slight cramping abdominal pains at times. Vomiting occurred at intervals of about an hour, the vomitus being greenish, and at times tinged with bright red blood, and much mucous. Soon after the accident the bowels began to move; after the third motion the stools lost their fæcal character and were replaced by small motions of serous character, containing much mucus and blood. Later on the stools had the appearance of laked blood of about a 5 per cent. strength. The temperature remained about normal, the pulse of good quality, 85, and respirations normal. Only seven ounces of urine were passed, of deep amber colour, containing about 1 per cent. albumen, numerous epithelial, hyaline and granular casts, some red blood cells and leucocytes. The skin remained absolutely dry and hot packs failed to produce sweating. In all, thirteen stools were passed.

2nd day. Seven sero-mucous stools, each tinged with varying quantities of blood. Much less griping. Urine only two ounces, with about 2 per cent. albumen and many casts. Still nauseated

and vomiting greenish fluid at intervals. Very little epigastric burning and no abdominal griping. Temperature up to 99°; pulse to 105. Systolic blood pressure 130.

3rd day. Condition remained the same; vomiting of greenish fluid, much uneasiness; two stools of watery character, and very little blood. No urine.

4th day. Four and one-half ounces of urine passed containing 1.8 per cent. albumen, many casts and fewer blood cells. Much nausea and vomiting, perspiring a little. Hiccough commenced and became very troublesome.

5th day. Vomiting less. Voided nine and one-half ounces containing 0·4 per cent. albumen. Some nausea and vomiting towards evening. Much hiccough.

6th day. Thirty-seven and one half ounces of urine with 0·4 per cent. albumen. Some vomiting and hiccough.

8th day. Fifty-five ounces voided, pale with only a trace of albumen, but many casts and blood cells.

9th day. Feels much better; thirty-nine ounces of urine with only a trace of albumen.

10th day. Much better but still nausea and vomiting.

The condition remained the same until the thirteenth day, when, during the night he had a chill, the temperature rose to 103·2° F. and he felt very uneasy. No cough and only the usual vomiting which, though it had diminished had never left him. A few hours later, a bright red macular rash, in places finely papular, appeared upon a slightly elevated, œdematous base. It was distinctly itching and was grouped in large irregular areas over the trunk and on the extensor and outer surfaces of the arms and legs. It was very faintly present on the forehead and cheeks, but was absent from the palms, soles, and mucous membranes. No catarrh of the respiratory passages, or injection of the conjuctivæ. The rash faded on pressure. The following day, it began to fade, the temperature was lower and he felt better. On the fourth day, the rash having completely disappeared, there was slight desquamation over the chest. The fever disappeared on this day.

From this time on until the end, his condition remained about the same, in that vomiting—sometimes only once or twice a day—persisted, with nausea, and he grew progressively weaker and thinner. Some days there would be a slight transitory elevation of temperature, but towards the end it tended to remain normal. The pulse became very small and the blood pressure fell. Three days before the end, the systolic pressure was 105. On the follow-

ing day he complained of considerable acute abdominal pain; twenty-four hours later he had a sudden seizure of very severe epigastric pain, when the abdomen was found to be very rigid in its upper half. Gradually he grew weaker and died eight hours later.

It is to be noted that the urine had shown a progressive improvement up to the twelfth day when he passed sixty-six ounces with a specific gravity of 1009, containing only 0·05 per cent. albumen, and only a few casts and blood cells. After this it began to fall in amount, while the albumen increased to about 0·1 per cent. This failure was attributed largely to the vomiting and the comparatively small amount of fluid taken. Towards the end he was passing only a few ounces per diem. The low specific gravity throughout is possibly in part due to the small amount of nitrogenous food given, and that feeding at any time was difficult on account of the vomiting. At no time was there any œdema. On the day before death the blood showed:

Hæmoglobin	90	per cent.
Red blood cells	4,350,000	
White blood cells	8,000	
Polymorphonuclears	66	" "
Small lymphocytes	22	" "
Large lymphocytes	10	" "
Eosinophiles	1	" "

The autopsy findings, twelve hours post mortem, are the following:

The body, though somewhat thin, is not emaciated; no abnormal pigmentation, and no œdema. On section there is a thin layer of tough, deep-yellow subcutaneous fat (atrophic). The mesentery and omentum contain considerable fat.

Peritoneal cavity. Free of adhesions; the convex surface of the left hepatic lobe is in part covered with a thin layer of friable, easily removed, recently deposited fibrin, and over the adjacent part of the right hepatic lobe, there is also some fresh fibrin. Over the convex surface of the spleen there is both recent and partly organized fibrin. The peri-splenitis is therefore an older affair than the peri-hepatitis. A little free, pale-yellow fluid containing large masses of jelly-like fibrin is found about a somewhat distended gall-bladder, but chiefly in the pelvis. No adhesions; all organs normally placed.

Pleural cavities. Free of adhesions and fluid.

Heart. Weight, 290 grams, well contracted, all chambers being almost empty. Epi- and endocardial surfaces smooth and glistening. Valves normal; myocardium rather pale but of normal consistence. Intima of aorta and pulmonary artery smooth and uniform in colour and thickness. Coronaries normal.

Lungs. Unusually pale-pinkish throughout (always lived in the country). A little hypo-stasis at the right base, otherwise the lungs are normal. Bronchial mucous membrane normal.

Œsophagus. Mucous membrane intact and pale-pinkish.

Stomach. Normal in size, and its walls of normal thickness and consistence. The mucous membrane is for the most part pale and normal and is covered, especially towards the pylorus, with a thick, tenaceous, bile-tinged mucous. No ulcerations.

Intestines. Mucous membrane intact throughout.

Pancreas. Of normal consistence and on section pale.

Gall bladder. Greatly distended with dark, thick bile; the ducts are clear.

Liver. Weight, about 2,000 grams. Surface smooth except as above noted. On section, the lobules are evident and well filled with fat. The central veins normal.

Spleen. Weight, about 450 grams. The surface is covered with patchy deposists of recent and organized fibrin, the latter milky in appearance. The pulp is fairly firm as it does not come off on the knife. The Malpighian bodies are prominent, and scattered throughout are many discrete yellowish bodies of varying size up to 4 m.m., which are obviously miliary and conglomerate tubercles. The trabeculæ are not abnormally marked.

Kidneys. Both are alike and together weigh 500 grams. Each is easily removed from a small amount of peri-renal fat. The surface is smooth and presents a mottled appearance, due to engorged stellate veins and many petechial hæmorrhages. The capsule strips readily, leaves a smooth surface, and on section the cut edge of the organ is sharp and not rounded off as would be the case were the parenchyma under increased tension. The cortex and medulla are clearly defined, but broader than normal. The veins stand out prominently as radiations in the medulla and throughout there are many small hæmorrhages. The glomeruli stand out fairly prominently, and many of these are congested. The pelvis, ureters, and bladder are normal.

Testes. The left is a little smaller than the right and is distinctly of firmer consistence. It is, moreover, firmer than the right and nothing can be scraped from its cut surface.

Bone marrow. That of the shaft of the femur is abundant, pale and fatty in appearance.

Lymphatic tissues. Immediately beneath the bifurcation of the trachea there is a very large gland 2·5 cm. in diameter, which, on section shows a centre of creamy yellow pus and cheesy debris, surrounded by a thin periphery of caseous tissue. The gland is so situated that it could easily press on the left recurrent larnyngeal nerve, and therefore, at least in part, be responsible for the severe cough and the huskiness of his voice that was present for months before his death. The mesenteric and retro-peritoneal glands are small and not remarkable.

Microscopically—

Heart. Myocardium normal.

Lungs. A section of the hyperæmic area shows small foci of broncho-pneumonia.

A few miliary tubercles are also present.

Liver. Lobules clearly defined and contain much fat in the outer zone. Here and there a miliary tubercle is found showing a marked tendency to sclerosis towards its periphery and very little caseation in its centre. The lobules show no focal sclerosis, and there is no increase of connective tissue.

Spleen. The Malpighian bodies are large and well formed. In the pulp there is a general increase of connective tissue so that the walls of the sinusoids are very clearly defined. The trabeculæ and capsule are thickened, the latter showing a deposit of recent and partly organized fibrin on its surface. The sinusoids are engorged with blood and contain numerous endothelial phagocytes filled for the most part with red blood cells. Scattered throughout are numerous miliary and conglomerate tubercles, the latter especially showing a tendency to caseate and break down. The necrotic centres are composed chiefly of pus cells and the dense connective tissue periphery contains enormous numbers of tubercle bacilli—sometimes as many as one hundred in a single field.

Pancreas. The parenchyma and insulæ appear for the most part normal and there is no increase of interstitial tissue. Scattered throughout, but mostly interlobular, are small foci of cellular infiltration—chiefly polymorphonuclear. Such are usually found in the neighbourhood of small vessels, particularly the interlobular veins, which, in addition often contain masses of polymorphonuclears in the lumen and in the vessel wall. The immediately adjacent parenchyma usually shows necrosis. There is also another phase of this inflammatory process—namely, a widespread

infiltration of many of the interlobular connective tissue septa with polymorphonuclear leucocytes. In places the lobule is also invaded by a few of these cells. Minute intra-lobular hæmorrhages are also quite numerous, the whole constituting a diffuse acute inflammation.

Kidneys. The most marked feature is the enormous engorgement of the vessels throughout, changes in the convoluted tubules and the glomeruli, and finally, a great increase of connective tissue. The glomeruli are for the most part enlarged, the capillary tufts being often swollen—partly due to congestion and partly to a definite increase of intracapillary endothelium. Some glomeruli of normal or slightly diminished size show definite lobulation of the tuft resulting from connective tissue proliferation. The tuft is usually retracted from the capsular wall leaving a considerable space, which, though often the result of tissue fixation, is often filled with red blood cells and a few leucocytes. Rarely there is proliferation of the capsular epithelium. A very great increase of interstitial tissue throughout separates the convoluted tubules. The lumina of the latter are usually dilated and the epithelium cuboidal or flattened—especially where there is much intratubular exudate or hæmorrhage. Occasionally a tubule is devoid of epithelium but the latter is often found in the cross section of probably the same tubule lower down, for here one may find two layers of epithelium firmly adherent to a central mass of erythrocytes, pus or debris. Smooth, glassy, eosin-staining casts, so constant a feature of chronic nephritis, are rare, as most of the casts are finely granular, being composed chiefly of cellular debris. In a few tubules there is a frank purulent exudate, usually in an area where there is extensive infiltration into the interstitial tissue. The tubular epithelium in many places is in part or totally destroyed while occasionally the cells are swollen and contain much fat in finely divided particles. Some of the degenerated cells are seen to be invaded by polymor phonuclear leucocytes. No mitosis of the epithelial cells is to be seen, though many tubules show such longtitudinal and lateral attenuation of flattened cells bridging a space between cuboidal cells, that there may have been here some attempt at regeneration. The collecting tubules are mostly filled with debris, blood, pus or granular casts, and in most of them the epithelium is intact. Rare miliary tubercles are also present throughout. The interstitial tissue is somewhat œdematous, greatly increased in amount and infiltrated everywhere with varying amounts of lymphoid cells. Where there are foci of acute

inflammation, the cells are chiefly polymorphonuclear. Furthermore, the latter are often seen entirely filling greatly dilated tubules, apparently having been attracted by the debris therein. There is nothing remarkable about the larger vessels.

Testicle (left). The parenchyma of the body of the organ shows most extensive destruction for there remains for the most part only shrunken, necrosed vestiges of tubules in which no cellular structure can be made out. The interstitial tissue is a little increased and is infiltrated with pus cells which are also often seen within the lumena of destroyed tubules. Towards the periphery of the organ there are intact tubules, so that the infection has involved chiefly the centre of the organ. The epididymis appears normal. In the adventitia of vessels accompanying the cord there are foci of lymphocytes but the vas deferens itself is normal.

Adrenals. Normal.

Bone marrow. Composed almost entirely of fat; otherwise normal.

Lymph glands. That found at the bifurcation of the trachea in an advanced state of destruction, shows tuberculosis. Those taken from the retro-peritoneal region also contain a few miliary tubercles.

Diagnosis

1. Acute and chronic diffuse nephritis.
2. General miliary tuberculosis, probably arising from the oldest and most extensive focus—the enlarged sub-tracheal gland.
3. Hypostatic pneumonia.
4. Acute peritonitis.
5. Acute pancreatitis.
6. Acute and chronic orchitis (mumps).

In view of the post-mortem findings, it seems highly probable that the prolonged and unusually severe cough and huskiness of voice were caused by pressure upon the left recurrent laryngeal nerve, exerted by the enlarged sub-tracheal tubercular gland. No light, however, is thrown upon the peculiar rash and symptoms that appeared on the thirteenth day—though it may be explained as of the nature of anaphylaxis.

It will be remembered that when a protein, such as that of horse serum is injected for the first time, the phenomenon of serum sickness may appear after several days—usually seven or eight. Either the individual is naturally abnormally hypersensitive to this protein in even small amounts, or the tissues have, as a result

of the innoculation, become from day to day more sensitive to the protein, until finally there is a definite local and constitutional reaction, presumably due to a residuum of the same protein that has not yet been excreted. Where the individual has already been sensitized by an injection months or even years before, a much more rapid and severe reaction may ensue. Again, where there is extensive destruction of epithelial cells, following, for instance, a severe burn, it is almost certain that a poisonous substance or substances are formed in the burned area, for it had been observed that in narcotized experimental animals, if the burned tissue is removed at once, the animal will recover, whereas, if allowed to remain in situ for some hours, death ensues. Furthermore, if burned skin is transplanted to a healthy animal, the latter shows symptoms of poisoning. If the circulation is shut off from a burned area, no intoxication occurs. The urine of cases of burning is highly toxic and when injected into animals it is said to produce symptoms quite similar to those characteristic of anaphylaxis. Heyde states that small burned areas sensitize an animal to further injections of burned tissue, and he with Vogt believe, that in some cases of burning, especially in those ending fatally twelve to thirteen days later, death may be the result of anaphylaxis, due to protein made foreign by the action of heat.

The exact nature of the toxin in anaphylaxis is not known, though the work of Vaughan and his co-workers seems to indicate that any protein is capable of being split into a toxic and a non-toxic fraction, the former being probably one and the same for all proteins, inasmuch as it may be obtained by boiling almost any protein in caustic soda. The toxic fraction from whatever protein derived, will produce all the symptoms of anaphylaxis. Vaughan's hypothesis is that a specific enzyme is produced whenever a foreign protein is introduced into the blood stream; that this enzyme will quickly split a second dose of the same protein, the toxic fraction of which will produce all the symptoms of anaphylaxis.

Therefore, if it is a fact that tissues altered by heat may produce toxic proteins capable of sensitizing the host and later on causing anaphylaxis, that the toxic group is the same, or nearly so, for all proteins as Vaughan believes, may it not as well be possible for a powerful necrogenic substance, such as corrosive sublimate, to so alter the proteins of the cells that it destroys, that such altered proteins are now foreign to the body and so can produce both sensitization and finally anaphylactic shock? This may explain in our cases the sudden temperature and rash, etc., on the thirteenth day following the poisoning.

A CASE OF RHEUMATIC FEVER WITH PURPURA, ŒDEMA OF THE GLOTTIS, ETC.

LIONEL M. LINDSAY, M.D.

Montreal

JEAN McF. was eleven years old when admitted to the Children's Memorial Hospital, complaining of pain and swelling in the ankles, knees, shoulders, etc., with swelling of the face and neck and a hæmorrhagic eruption over the left shoulder and both elbows.

Jean had been born in Scotland and came to Canada at the age of five. She had always been a healthy child with the exception of measles, pertussis, and varicella. She had never suffered from rheumatism, growing pains, chorea, or tonsilitis, nor had she shown any evidence of a so-called hæmorrhagic diathesis with the following exception. At the age of seven months, after vaccination, both feet and legs became swollen and discoloured with deep red patches. The condition lasted about one week, during which time she screamed a great deal as if in pain.

Three days prior to admission she had been suddenly taken ill with what appeared to be an ordinary attack of rheumatic fever. Sodium salicylate was ordered in four grain doses every four hours by her physician, who two days later referred her to the hospital.

Examination on admission showed a rather thin, pale though well developed girl. She could answer questions intelligently, but seemed decidedly dull and "heavy". The most striking feature was the marked swelling of the left side of the face and neck, which pitted on pressure and prevented her from opening her eye. Scattered over her body were several areas of ecchymosis, deep-red, mottled and sharply circumscribed, not raised and not fading on pressure. These areas varied in size from a five-cent piece to the palm of the hand. The largest areas were on the left side of the face, the left shoulder, behind both knees, and over the sacrum. There was a deep-seated "bruise" on the dorsum of the left foot, tender to touch. Arthritis was present in the left

Read at the fifth regular meeting of the Montreal Medico-Chirurgical Society. December 7th, 1917.

shoulder, right knees and elbow. These joints were painful, tender and swollen.

The heart was somewhat enlarged in all directions (4 c.m. to right—9 c.m. to the left). The action was rather rapid but regular. There was a loud rough systolic murmur heard best at the apex and transmitted round the axilla to the back. There were no signs of cardiac weakness.

There were no enlarged lymph nodes, but the tonsils were rather large and the pharnynx congested. There was a small hæmorrhage in the gum below the left incisors.

The urinalysis was negative—no albumin, no blood, no casts.

Diagnosis: Rheumatic fever, purpura, carditis.

Sodium salicylate (5 gr. q. 4 h.) was administered.

Little change was noted in her condition until the afternoon of the following day when she suddenly began to gasp for breath. In a few minutes her condition became desperate, she was unable to draw her breath and was becoming deeply cyanosed. In short she was suffering from acute œdema of the glottis. She was rushed to the operating room and tracheotomy performed, which gave immediate relief.

From that time the œdema gradually diminished, although the subcutaneous hæmorrhages continued to appear in crops chiefly on the legs and thighs. These spots were much smaller than the original, varying in size from a five-cent to a ten-cent piece.

By the end of the first week in the hospital her condition was greatly improved. The tracheotomy tube had been removed, and her temperature which had usually been over 101° was now below 100°. She was able to read and to feed herself, and on the whole was very comfortable, although she still had some pain, tenderness and swelling of the left foot, and left hand and wrist. There was also a crop of herpes at both corners of the mouth. The original ecchymoses were beginning to fade, though still a deep fawn in colour.

Her recovery was rather slow but steady. She remained very thin and pale for many weeks, and on one occasion is reported to have had an eruption of erythema multiforme with increase of cardiac symptoms. But these were of short duration, and on the whole her condition has remained very satisfactory. Cardiac hypertrophy and mitral insufficiency are of course, still present, but her heart responds well to moderate exercise.

The salient points of this case are the arthritis, with carditis,

marked purpura and œdema which involved the glottis. But at no time did she have any abdominal crises, or hæmorrhages from any of the internal organs, such as would occur in Henoch's purpura. Apparently then this was a case of what the English writers call Purpura Rheumatica.

The question was raised, early in the disease, whether the purpura (including the œdema) might not be due to an idiosyncrasy to sodium salicylates, as this drug, like iodides and mercury, is known to cause purpura. Reference was made to a case published by Dr. Shepherd (*Jour. Cutan. & Genito Urin. Dis.*, vol. xiv, 16, 1896), and the two cases were found to correspond to a certain extent, but not sufficiently to convince us that the two cases were of the same pathogenesis. Furthermore on one occasion when the patient came to the out-patient department with slight fever and vague pains I prescribed aceto-salicylic acid, twenty grains a day, for one week, without causing a reappearance of purpuric symptoms.

In conclusion I should like to express my appreciation to Dr. H. B. Cushing for permission to study and report this case, and to Dr. Gordon Campbell for his interest in photographing the skin lesions, to Dr. J. T. Rogers whose prompt action saved the little girl's life.

At the annual meeting of the Stratford General Hospital, which took place on March 1st, it was decided that the hospital year should end on September 30th, instead of December 31st, and that the annual meeting in future should be held in December. The admissions to the hospital during the year numbered five hundred and fifty-one.

Editorial

LEGISLATION FOR PROTECTION AGAINST VENEREAL DISEASE

SINCE August, 1914, there has been a great awakening of the public conscience in many directions, and the importance of matters connected with the health of the people is receiving more general recognition. It therefore seems timely for the launching of some great movement against the ravages of gonorrhœa and syphilis.

The prevalence of prostitution and sexual promiscuity in all countries makes syphilis and gonorrhœa endemic amongst the population. In 1901 the "Committee of Seven" reported that there were apparently 162,372 patients suffering from venereal disease in New York city alone. The same proportion exists in other North Amerian cities. Conservative authorities estimate that from 51 to 60 per cent. of our adult male population have had gonorrhœa, of whom about 20 per cent. became infected before they were twenty-one years of age. Among women gonorrhœa, though more severe, is less common than among men, the proportion of men to women being about fifteen to one. It is shocking to learn that almost one-third of the reported cases of gonorrhœa in a large American city occurred in married women, to whom infection had been conveyed by their husbands. Nine hundred and eighty-eight cases of marital infection were reported, and the unreported cases were believed to be six times as numerous. We may add to this the ghastly array of about five hundred children. A disease that attacks more than half our young men and that affects thousands of children and hundreds of thousands of women, a disease that enters the family almost entirely through illicit sexual contact, a disease that may be transmitted long after the

patient thinks himself or herself well, a disease transmitted to the wife from a prostitute via the husband, from wife innocently carried to her child, a disease that is the cause of most of the major gynæcology of to-day, that causes fifty per cent. of involuntary sterility, that makes chronic invalids of many, and kills not a few, a disease that destroys the power of procreation in men as well as in women, is indeed one of the most serious perils—if not *the* most serious—of our war-ridden countries of to-day.

Although Canada and the United States are probably further in the rear than any other great nations in the world in their efforts to control venereal disease as a national problem, they are fortunate in having the way paved by epoch-making movements such as those of the Scandinavian countries, and by the studies of the Sydenham Royal Commission in Great Britain. Progress in this country is much slower, hampered by peculiarities of mental outlook, and considerations very different from those which have controlled the thought of Europe. The effect of finding the problem of gonorrhœa and syphilis bound up with the subject of social evils has been to perpetuate in popular thought an association which simply blocks the way to any solution of the public health problem. It is one of the most significant features of this great movement now on foot all over the world, and they have finally adopted the direct route, and are attacking syphilis and gonorrhœa as diseases and not by way of their association with prostitution. It cannot be too strongly impressed that a reasonable conservation should temper the ardour of reformers, or more harm than good will be done by the collapse and failure of ill-considered special legislation. Freak legislation and fool schemes are the familiar preliminaries which precede the grim onset of a real attack supported by true public sentiment. Typical examples of such premature legislation may be found in the setting up of the Wassermann test as evidence of fitness for marriage in some States, and in the efforts of certain official

agencies to enforce the reporting of syphilis and gonorrhœa by name. The many social remedies may well be boiled down to three main types, viz.—First, individual prevention; second, methods of dealing with prostitution; third, a moral educational campaign.

To discuss fully the relative merits of the three would require a volume. The first we may easily pass by. Segregation and reglimentation of prostitution is employed with notable failure in France and Germany. It fails in theory by not quarantining the males, in practice by omitting the lewd housemaid, the shop girl and the errant widow. The moral campaign of education to old and young has its spurs to win. It is very full of promise. It is hard to see how such education can fail to save many innocents from venereal diseases and moral woes far worse. Repeated sifting of the facts by investigations has gradually crystallized into fairly definite form the essentials of a programme for controlling venereal disease.

First the provision of universally available good treatment at the expense of the State, if necessary, for the diseases in question.

Second, provision by the State of efficient means of recognizing those diseases at the earliest possible time, and greatest possible certainty.

Third, suppression of quack practice of all kinds.

Fourth, compulsory measures and penalties obliging patients to receive and continue treatment until cured.

Fifth, reporting of cases of sexual diseases to the health authorities.

Sixth, moral and educational prophylaxis, and the vigourous suppression of prostitution.

Saskatchewan is the first of our provinces to include venereal diseases amongst maladies classified as contagious. All cases of syphilis, gonorrhœa, and chancroid in future must be reported within three days to the Commisssioner of Public Health by the physician in attendance. In reporting the

cases the physician is required to mention certain particulars regarding the patient as to his age, marital relations, occupation and probable source of contagion. The name of the patient, however, will not be stated unless the said patient fails to return for treatment within thirty days. This measure makes it possible at least to ensure that cases once recognized will receive proper treatment, and it is hoped that every physician will coöperate with the Saskatchewan Government in its effort to restrict the spread of these diseases. In the Province of Ontario an active campaign is being conducted against venereal diseases, and an enquiry into the subject is being made and governmental action will probably be taken during the next session of its Legislature. Let us hope that all the other provinces of the Dominion will follow suit, or better still, that the Dominion Government will follow suit, and later perhaps it can be made possible to have all the provinces under the direct supervision of a central Dominion Health Board.

THE following suggestions in regard to the establishment of municipal hospitals were made at a conference between Hon. George P. Smith, the provincial secretary of Alberta, and a delegation representing the rural municipalities of that province.

1. In making boundaries for any hospital area, that municipal boundaries may be disregarded.

2. Location of hospital: The provincial secretary shall make the decision as to location of hospital; to that decision, any twenty-five ratepayers may appeal to the public utilities board whose decision will be final.

3. The decision to organize under the Hospital Act will be by referendum vote of the entire area and the majority vote shall rule, providing that a municipal unit voting adversely may be permitted, under exceptional circumstances, to withdraw from a particular hospital area on condition that it is to become a portion of another hospital area.

In the petition for a referendum vote, instead of requiring twenty-five applicants from each municipality, a clause is substituted which permits of the securing of signatures equivalent to twenty-five from each municipal unit no matter where they may be secured. It was also recommended that the flat rate be used as a means of taxation for building and operating these hospitals.

THE second *Bulletin of the Association of Medical Officers caring for Tuberculous Soldiers in Canada* was issued by the Military Hospitals Commission on February 28th. It is the eighth bulletin published by the Commission and is a continuation of Bulletin No. 7, which appeared in January. The latter contained a review of the work accomplished during 1917 in the treatment of tuberculous soldiers. At the end of that year military patients suffering from tuberculosis to the number of 3,075 had been cared for by the Commission; of these 1,358 had been discharged and 1,717 were still undergoing treatment on December 31st. This bulletin also contained a valuable report on the vocational training of the tuberculous soldier, written by Mr. T. B. Kidner, the officer in charge of that branch of the work. The substance of this article has already been given in the JOURNAL.

Bulletin No. 8 gives the number of soldiers undergoing treatment in the various sanatoria under the direction of the Commission as 1,348, of whom nine hundred and eighty-six had been overseas. The out-patients numbered one hundred and seven. Nine patients died and one hundred and eighty-five were discharged. This bulletin contains excellent reports on the work being done in the provinces of Saskatchewan and Nova Scotia. Captain L. G. Houle points out that until the Earl Grey Sanatorium was opened in Regina in July, 1917, that province was without accommodation for cases of tuberculosis outside of beds in the general hospitals. Since then one hundred and forty-six admissions have been made to the sanitorium, of whom eighty-seven have been discharged and five

have died. Of those discharged, twenty-seven were improved, nineteen were quiescent, ten apparently arrested, two unimproved, twenty-two were classed as "untreated" since they were resident less than twenty-one days in the institution, six were doubtful cases, and one non-tuberculous. The provincial sanatorium at Qu'Appelle had been commenced before the war, but after August, 1915, its construction was discontinued. A part of the original plan, however, has recently been completed and the hospital now has a capacity of seventy-five beds. As the accommodation provided at the military institution, the Earl Grey Sanatorium, was insufficient, arrangements were made for the admission of soldiers to the provincial institution, where there are at present twenty-two military patients. Captain Houle states that the men are more content at Qu'Appelle than in Regina, where the distractions of the town render it difficult to enforce discipline. He also points out the need for a system of following up discharged cases of tuberculosis in that province.

Captain Miller contributes a report on the situation in Nova Scotia, where in order to provide the necessary accommodation for military patients, two pavilions and one infirmary have been added to the provincial sanitorium at Kentville. A vocational training building, which was completed in October, 1917, has proved inadequate and is now being enlarged. In June of last year it was necessary at short notice to provide accommodation for one hundred and thirty-six tuberculous soldiers upon arrival at Halifax. A colony of tents was therefore laid out in connexion with the sanitorium and these later were replaced by three temporary wooden buildings.

The bulletin also contains abstracts from a booklet written by Mr. Denham, clerk to the Brighton Insurance Committee, England, in which the proposal is made that self-supporting colonies should be established for the treatment and care of tuberculous soldiers, the facilities eventually to be available for the whole population.

The Association

PRELIMINARY PROGRAMME—COMBINED MEETING

HAMILTON, ONTARIO

Monday, May 27th, to Saturday, June 1st, 1918.

Ontario Medical Association, Canadian Medical Association, Canadian Association for the Prevention of Tuberculosis, Canadian Public Health Association, Ontario Health Officers' Association

Monday and Tuesday

Canadian Public Health Association and Ontario Health Officers' Association

President's address, (Canadian Public Health Association)—"A Plea and a plan"—W. H. Hattie, Halifax.

President's address (Ontario Health Officers' Association)—H. W. Hill, London.

"The public health nurse"—J. A. Baudouin, Lachine.
Paper (title to be announced)—M. M. Seymour, Regina.
"Good public health service in small towns and rural municipalities"—J. J. Harper, Alliston.
"Hints on rural health administration"—J. W. S. McCullough, Toronto.
"The control of an outbreak of diphtheria"—W. C. Allison, Toronto.
"The trail of the medical vampire"—Frederick Paul.
"Health insurance"—Charles J. Hastings, Toronto.
"The venereal disease problem"—Gordon Bates, Toronto.
"Why is it worth while to establish sewerage in a small town?"—F. A. Dallyn, Toronto.
"Interpretation of water analysis"—H. M. Lancaster, Toronto.
"Mental hygiene"—Clarence M. Hincks, Toronto.

Symposium on Child Welfare.

Chairman's address—Alan Brown, Toronto.
"Child welfare in war time"—Isaac Abt, Chicago.

"Progress in child welfare work in Europe"—Grace L. Meigs, Washington.
"The results of three years' work in the department of child hygiene, Toronto"—George Smith, Toronto.
"The medical student in his relation to infant and child welfare work"—Richard Bolt, Cleveland.
"The management of a child welfare week in small cities and towns with results"—Mary Power, Toronto.

Round table discussion and subscription luncheon

Alan Brown, chairman.

Wednesday, 9.00 a.m.

Canadian Association for the Prevention of Tuberculosis,

Ontario Health Officers' Association and Canadian Public Health Association

Secretary's report—G. D. Porter, Toronto.
"The rôle of the health officer in the control of tuberculosis."—H. W. Hill, London.
"Heliotherapy by the Rollier method as applied to surgical tuberculosis with lantern demonstrations"—John H. Pryor, Buffalo.
"President's address"—J. A. Machado, Ottawa.
Social and public health aspects of tuberculosis.

10.00 a.m.

Ontario Medical Association

General Business Session.

10.30 a.m.

Canadian Medical Association

General Business Session.

2.15 p.m.

Ontario Medical Association

"President's address"—John P. Morton, Hamilton.

2.30 p.m.

Canadian Association for the Prevention of Tuberculosis:

Symposium on the Diagnosis and Treatment of Tuberculosis:

Differential diagnosis—J. S. Pritchard, Battle Creek.
Sanatorium treatment—A. F. Miller, Kentville.
Artificial pneumothorax—D. C. Parfitt, Gravenhurst.
Tuberculin treatment—J. H. Elliott, Toronto.

8.00 p.m.

Ontario Medical Association, Canadian Public Health Association Canadian Medical Association

General Session:

The returned soldier problem.

Thursday, 9.00 a.m.

Ontario Medical Association and Canadian Medical Association

Meeting of Sections.

2.00 p.m. and 8.00 p.m.

General Session:

Address in Medicine—Lewellys F. Barker, Baltimore.
Address in Surgery—Charles Mayo, Rochester.
Address in Obstetrics—(to be announced).
Address in Pediatrics—I. A. Abt, Chicago.
Address on the Ear—Isaac Jones, Philadelphia.

Friday, 9.00 a.m.

Canadian Medical Association and Ontario Medical Association

Meeting of Sections.

2.00 p.m.

Symposium on Intra-Cranial Pressure:

Medicine—W. F. Hamilton, Montreal.
Surgery—A. E. Garrow, Montreal.
Physiology—J. J. R. Macleod, Cleveland.

8.00 p.m.

General Sessions

Saturday, 9.00 a.m.

Hamilton Clinical Day.

In the section of medicine amongst others the following have consented to take part:—L. Rowntree, Minneapolis; Thaddeus Ames, Beatrice Hinkle and W. Gordon Lyle, New York; I. Chandler Walker, Boston; Thomas McCrae, Philadelphia and W. G. MacCallum, Baltimore. On eye, ear, nose and throat, Casey Wood, Chicago; Walter Parker, Detroit; John Wheeler, New York; Joseph Beck, Chicago; and H. Halsted, Syracuse; R. F. Ridpath, I. H. Jones, Philadelphia: G. B. New, Rochester, Minn. In surgery, Dr. McGuire, Buffalo; C. E. Hyndman, St. Louis; Donald Guthrie, Sayre; and Dr. Henderson, Rochester.

Regarding the work in the sections, the general principle will govern in all that there will be very few papers, but it is the expectation of the Committee that each paper presented will promote a very elaborate discussion so that in a sense each will represent a symposium. The writers of the papers are asked to present a synopsis which should be ready and in the hands of the Committee before March 25th.

It is proposed to have in addition to the regular programme of sections and general sessions, an innovation in the nature of a "Round Table Discussion" on a matter of vital interest to the profession as a whole. This will be arranged for late in the day when the regular programme is finished. Accommodation will be limited and all seats reserved.

A personal conference in Ottawa with Surgeon-General Fotheringham of the Militia Department and others interested in the Returned Soldier Problem, resulted in developing the plans for the Symposium on this subject for Wednesday evening in a very satisfactory manner.

Plans are also under way for the presentation of a most interesting collection of scientific exhibits. There will be a pathological exhibit which will include a very fine collection of museum specimens from the McGill University Museum, and will be in personal charge of Dr. Maude E. Abbott, of Montreal; also an exhibit from the Babies' Hospital, of New York, of a number of specimens

illustrating pneumonia in children and an extremely interesting exhibit from the National War Museum of Canada, being the first consignment of war specimens received from the front, shown by special permission of Surgeon-General Fotheringham. It is hoped also to obtain similar exhibits of equal interest from the museums of Queen's Medical College, Kingston, of Toronto University, and the Western University of London. There will be a series of demonstrations of clinical laboratory procedures, including those of special interest to the general profession, such as the Wassermann reaction, the colloidal gold functional kidney test, dark field spirochæta, and the preparation of serums and vaccines for therapeutic use.

For the *x*-ray exhibit, plates are requested to be sent in by men interested in this work. There will be a daily informal demonstration and a lantern will be available for those wishing to use it.

There will be shown daily from four to six, moving pictures on medical and surgical subjects including subjects of interest to the general practitioner.

The American Medical Association have offered the use of their charts, illustrations, and literature, relating to the propaganda for reform as carried on by that Association.

The Local Committee also wish to announce that it is their wish to carry out the programme and all entertainments with greatest respect for war conditions. While there will be no formal receptions or entertainments, this Ambitious City will go the limit of its capacity in its efforts to make the visiting members welcome, comfortable, and satisfied.

RAILWAY RATES

The usual reduced rates have been arranged on all the Canadian roads. These special rates may be obtained by doctors attending the meeting, and by members of their families accompanying them.

In order to take advantage of these rates it will be necessary for the physician when starting, first, to purchase a single first-class ticket (which must cost not less than 50c.) to place of meeting, and second to obtain from his ticket agent a standard certificate properly filled in and signed by the latter. This must be presented to the General Secretary of the Association when registering at the meeting. It will be filled in by him and viséd by a special agent of the transportation companies, who will attend for this purpose

and who will collect the sum of 25c. for each certificate examined. The presentation of this form properly filled in and vised will entitle the holder to a return ticket to his home either free of charge or at two thirds, or one third, the regular first-class fare, depending on the number attending the meeting.

From points east of Fort William, Ontario, tickets must be bought between May 23rd and May 29th, inclusive, and the return journey may be made up to and including June 5th, 1918. From points West of Fort William, and Armstrong, Ontario, tickets must be bought between May 22nd and 25th, inclusive; from British Columbia between May 19th and 22nd, inclusive. Certificates for the return journey to the west will be honoured at Hamilton up to and including June 5th. A thirty-days' extension may be secured by the additional payment of one third the full fare from place of meeting to starting point. Stop-overs will be granted holders of these extended tickets.

We would point out to our members that the above special rates apply as well to the boats of the Canada Steamship Lines, as to the railways.

It is hoped that our members will note that it is important to fulfil all conditions mentioned above, and it should be emphasized that the greater the number attending, the less will be the cost of railway transportation.

Pacific Coast and Province of British Columbia

Since the publication of the March number we have been advised by the Transcontinental Passenger Association that this year they cannot grant reduced fares on the Certificate Plan described above. Those from Pacific Coast points and British Columbia who wish to attend the meeting will therefore have to avail themselves of the regular nine months' excursion fare, which may be purchased any day throughout the summer and which is good for return up to any time within nine months from date of purchase. The cost of this ticket is about one fare and a third.

Obituary

LIEUTENANT-COLONEL JOHN McCRAE

THE following letter of condolence on the death of Lieutenant-Colonel John McCrae has been forwarded to the JOURNAL by Colonel H. E. Snell, A.D.D.M.S., Canadians, as an expression of feeling from the Medical Officers of the Canadian Army Corps in France:

Resolution of sympathy to Mr. and Mrs. McCrae from the Medical Officers attached to the Canadian Corps in France.

"The medical officers attached to the Canadian Corps learn with deep regret of the death of Lieutenant-Colonel John McCrae, who in the early part of the war was attached to the Canadian Corps, and did such good service as medical officer to a Canadian Field Artillery Brigade.

"We realize what a great loss the Canadian Army Medical Corps and the medical profession of Canada have suffered, but feel how much greater the loss to you, his father and mother, must be.

"We extend to you our sincerest sympathy, in the hope that the knowledge that you have given your son in such a great cause, may in some measure be a comfort to you and help you in your sad bereavement.

"February 2nd, 1918."

DR. F. W. DYKES of La Riviere, Manitoba, was unfortunately burned to death on February 13th. It is not known how the fire occurred, but at the time Dr. Dykes was alone in the house and it is thought that he was probably asleep and was asphyxiated. His charred body was found among the ruins of the house. Dr. Dykes graduated from the Manitoba Medical College in 1906 and since then had been in general practice at La Riviere. He was well liked and respected and his tragic death cast a gloom over the entire community. A widow and one son survive him.

DR. JOHN S. BOOTH, who was in practice in Montreal, died from injuries sustained when he was struck by a street car upon alighting from one going in the opposite direction. As he was pinned beneath the car, it was impossible to do anything for him

until the front of the car could be lifted up. When this had been accomplished he was taken at once to the hospital but died shortly afterwards. Dr. Booth, who was fifty-three years of age, graduated from McGill University in 1887 and had a large practice in Montreal. He leaves a widow and five children.

Dr. Louis G. McKibbon, who had been in general practice in Toronto for twenty years, died on March 4th, in the fifty-third year of his age. Dr. McKibbon was born at Teesdale, Ontario, and graduated at Trinity Medical College in 1886. He practised for a short time at Blackstock before going to Toronto. He was attached to the staff of the Western Hospital at Toronto, and was a member of the Masonic craft. A widow, two daughters and three sons survive him.

The forty-first annual report of the Victoria General Hospital, Halifax, was tabled in the House of Assembly by the Hon. H. E. Armstrong in February. The report gives the number of patients admitted during the past year as 1,910 and the total number of cases treated as 2,068. One hundred and twenty-five deaths took place. The income during the year amounted to $26,976.93 and the expenditure was $122,273.22. The average daily cost of maintence was $2.19 per patient. During the year Dr. J. Frank Mack was appointed dermatologist in succession to the late Dr. James Ross. Dr. A. R. Cunningham was appointed assistant in the eye, ear and nose department, and Dr. M. A. Macauley in the department of gynæcology.

Miscellany

News

MARITIME PROVINCES

A BILL to consolidate and amend the Act relating to Public Health was introduced in the Nova Scotia House of Assembly on February 28th, by Mr. W. Chisholm, the member for Antigonish.

THE Halifax Board of Control on February 25th passed a resolution in favour of building an isolation hospital, which should cost about $27,000, of which $10,000 would be contributed by the Relief Commission.

It is understood that the Bill to amend the Public Health Act of the province of New Brunswick, which is to come before the legislature in all probability during the present session, contains a clause relating to the control of venereal disease.

THE annual report of the St. John Branch of the Victorian Order of Nurses gives the number of visits paid during the year 1917 as 7,885. The cases attended numbered 1,004, nine hundred and eighty-one of which were new patients. Among these were two hundred and ninety-eight infants, twelve chronic cases, three hundred and seventeen obstetrical cases, forty-five gynæcological cases, and one hundred and sixty-two surgical cases. The number of cases of tuberculosis is given as three.

QUEBEC

AN enquiry into the municipal affairs of Montreal was recently made by the Bureau of Municipal Research and a report submitted to the city council. Speaking of the board of health the report says that the board, consisting of the mayor and seven aldermen, two being physicians, and the medical officer of health, has not performed any function of value and has met only five times since May, 1911. It therefore cannot be considered to have carried out the duties entailed in its advisory capacity to the medical officer of health, and it is recommended, therefore,

that this board, as at present constituted, be abolished. The report praises the excellent work of Dr. Seraphin Boucher, the medical officer of health, and recommended that he be permitted to choose the members of a board of health from among citizens who are interested in matters relating to public health. The report also recommends the appointment of an assistant medical officer of health.

At the annual meeting of the Sherbrooke Hospital Board in February, Mr. Mackinnon, the president of the hospital, stated that the per diem cost of maintenance had increased from $1.97 to $2.35 for each patient and that the institution was in urgent need of financial assistance.

During the past year 1,074 infants were treated in the St. Justine Hospital at Montreal, and medical attention was given to nine thousand children in the out-door department.

ONTARIO

A Bill on venereal disease was introduced in the provincial legislature by the Hon. I. B. Lucas on February 25th, and had its second reading on March 5th. The Bill has been drawn up along lines suggested by Mr. Justice Hodgins in the report recently submitted by him to the government. After the second reading of the Bill, it was decided to place the matter in the hands of a committee consisting of Dr. W. Jacques of Haldimand, Dr. Forbes Godfrey of West York, Dr. A. W. Nixon of Halton, Dr. J. B. Martyn of Lambton East, Dr. E. Jessop of St. Catharines, Dr. J. M. Robb of Algoma, Mr. V. A. Sinclair of Oxford, Mr. C. McKeown of Dufferin, Mr. C. McCrae of Sudbury, Mr. Thomas Marshall of Lincoln, Mr. S. Carter of South Wellington, Mr. S. Ducharme of North Essex, Mr. J. C. Elliott of West Lambton, and the Hon. I. B. Lucas.

The 1916-1917 report of the Hamilton Board of Health gives the number of deaths caused by the following diseases as: pneumonia, one hundred and thirteen; heart failure, sixty-three; apoplexy, forty-seven; tuberculosis, sixteen; diphtheria, twenty-seven.

Grants to the amount of $52,160 for the Hospital for Epileptics at Woodstock were included in the supplementary estimates

passed by the provincial government in February. It is the intention that the sum of $40,000 shall be expended in the erection of two additional buildings.

At a meeting of the Perth County Medical Association in February last, it was decided that the usual fees, instead of the reduced fees charged last year, should be charged to the wives and dependents of soldiers.

Last year one hundred and sixty-five patients were admitted to the Brantford General Hospital. The number of deaths was six, and fourteen births occurred. The annual report presented to the board of governors draws attention to the need for a larger and better equipped isolation building, the present being inadequate in every way.

MANITOBA

An urgent appeal for assistance was made in February to the Winnipeg City Council by a delegation from the General Hospital, who requested that a grant of $60,000 be made to enable the hospital to meet its most pressing obligations.

The annual meeting of the Grace Hospital, Winnipeg, was held on February 11th. The work of the institution, which is under the direction of the Salvation Army, is divided into three departments: the main building is divided into private, semi-private and public wards; the wing is devoted to rescue work; and the annex is used for the accommodation of children whose mothers are in hospital. The objects of the institution are to provide care and medical treatment for friendless girls and women, and to care for mothers among the deserving poor; a number of beds are reserved for the accommodation of patients who can afford to pay for treatment. During 1917, eight hundred and fifteen maternity cases were admitted to the institution.

ALBERTA

It was decided at a meeting of the Calgary Hospitals Board on February 20th, that a request should be made to the provincial government that the Hospitals Act be amended. The Act as at present constituted provides that a sum of money equivalent to the cost of maintaining indigent patients from outside municipalities may be collected from the municipalities, but the regu-

lations of the rural municipalities, towns and villages provide that the sum of one dollar a day may be collected from the towns and villages, and seventy-five cents from the rural districts, whereas the present cost of maintenance is over two dollars a day for each patient, towards which the provincial government grants twenty-five cents. A committee was also appointed to approach the government with the request that a hospital for incurables be erected in the province.

About two years ago an institution for mental defectives was opened in Regina. The accommodation is limited to thirty beds and at present there are twenty-eight patients in the institution, whose condition varies from imbecility to that of the high-grade feeble-minded. An effort is made to correct destructive propensities and train habits of regularity in the imbeciles, the majority of whom, however, are bed-ridden or at least suffer from bodily disability. The feeble-minded are all women and they are taught housework, needlework and similar duties; these cases, of course, will require permanent supervision.

ARMY MEDICAL SERVICES

The Bar to the Military Cross has been awarded to Captain Frederick W. Lees, C.A.M.C., of Toronto.

The Military Cross has been awarded to the following:
Captain G. M. Foster, C.A.M.C.
Captain A. S. Porter, C.A.M.C.
Captain H. C. Davis, R.A.M.C., of Schomberg, Ontario, and formerly in practice in Vancouver.

The Military Medal has been awarded to Sergeants F. S. Butler and M. E. Martin; Corporal R. S. Greenaway; and Privates T. Canning, F. J. Miles, S. J. Patterson, H. H. Riley, J. M. Ritchie, F. A. Smithers, and C. J. Tomlinson.

It is believed that Captain Frank Park and Captain W. R. Haight, of Toronto, have been released in a recent exchange of prisoners with Germany. It will be remembered that they were taken prisoner in 1916 at Zillebeke.

Lieutenant-Colonel Kenneth Douglas Panton, C.A.

M.C., of Vancouver, is now in command of No. 14 Canadian General Hospital, which is stationed at Meads, near Eastbourne, in England. Lieutenant-Colonel Panton has been on active service since shortly after the commencement of the war and was in command of No. 5 General Hospital at Salonica.

THE following promotions in the Canadian Army Medical Service are gazetted:

Temporary Major C. F. L. Haszard from Canadian Light Horse transferred to the Canadian Army Medical Service.

To be temporary Majors: Temporary Captains W. L. Shannon, F. G. Logie, J. C. Wickham, A. T. Henderson, A. H. Pirie, C. A. McDiarmid, R. B. Robertson, G. F. Boyer, L. M. Rice, J. H. McPhedran. Temporary Captains (acting Majors) J. W. Hutchinson, H. C. Burgess, and W. H. Lowry.

Temporary Captains to be acting Majors: R. J. Gardiner, G. W. Hall, H. W. McGill, M.C., W. H. Scott, M.C., A. B. Chapman, M.C.

To be temporary Captains: S. E. Beech, G. B. Wiswell, temporary Major A. Stirling from New Brunswick Regiment, and temporary Lieutenants D. R. Finlayson, and D. S. McCurdy.

As was stated in the last issue of the JOURNAL, No. 1 Canadian Stationary Hospital has been converted into No. 13 Canadian General Hospital and is now stationed at Hastings, England. While in the East this hospital was stationed in Lemnos Island (Dardanelles), Egypt, and Salonica, having served six months in France and six months in England before going East. Of the original staff, only three remain, viz. Lieutenant-Colonel E. J. Williams, D.S.O., of Sherbrooke, Quebec, the officer in command; Major J. G. W. Johnson, of Montreal, second in command; and Honorary Captain and Quartermaster F. E. Currey of Calgary.

Canadian Literature

ORIGINAL CONTRIBUTIONS

Canadian Practitioner and Review, February, 1918:

Poliomyelitis	Capt. H. W. Hill.
Radium in tuberculosis of the skin .	W. H. B. Aikins.

The Canada Lancet, February, 1918:

Unexpected abdominal findings	W. H. Harris.
Combination treatment of syphilis by medicine and electric massage	Sir James Grant.
Some work with minor anæsthesia	H. O. Howitt.

Book Reviews

GENITO-URINARY SURGERY AND VENEREAL DISEASES. By EDWARD MARTIN, A.M., M.D., F.A.C.S., professor of surgery University of Pennsylvania; and others. Tenth edition, 893 pages, illustrated with 422 engravings and 21 coloured plates. Price $7.00. Publishers: J. B. Lippincott Company, Philadelphia, London, and 201 University Building, Montreal.

This, the tenth edition of a well-known volume, appears long after the ninth, but fully justifies the necessary delay. Over two-thirds of the book is devoted to urology, the remainder to syphilis. It well represents the most practical views of the day including short discussions on vaccines and serums; tests of renal function; high frequency dessication; and on laboratory diagnosis of syphilis.

The chapters on symptomatology and diagnosis are full and well illustrated; the operative work is written in full detail and has many illustrations, while a large amount of space is devoted to treatment, the whole rendering the book especially valuable for both practitioner and student.

Medical Societies

THE KINGSTON AND FRONTENAC MEDICAL SOCIETY

THE society held its regular meeting January 14th, Dr. Mylks, the president, in the chair.

Professor T. L. Patterson read a paper on the "Emergency functions of the spleen in the light of recent investigations", a synopsis of which is here given.

Some of the older ideas in regard to the function of the spleen were first discussed. It is thought by many, and especially by

the clinicians, to be an organ for the destruction of the red blood cells, but many physiologists are more apt to take the stand that since the red blood cells have lost their nucleus, they are on the way to destruction before they even reach the spleen, and that the destruction of these cells takes place in the blood stream, or any part of the circulation, there being probably no special organ or tissue in the body charged with the function of destroying these cells. The liberated hæmoglobin, due to this disintegration and dissolution in the blood stream, is carried to the liver, and there excreted as bile pigment. By calculating the output of iron in the fæces, and determining the amount of hæmoglobin in the blood, we find that after splenectomy in dogs, there is an increase in the output of iron from 11 to 29 mgm. with a marked diminution of hæmoglobin in the blood. The author of the paper exhibited one of his original charts showing these results.

The spleen may also be concerned in the manufacture of uric acid, and according to several investigators there is an existing relationship between it and the pancreas, whereby the spleen is supposed to furnish a substance of proteolytic importance in the formation of the pancreatic juice. Others claim that there is also an existing relationship between the spleen and the liver, while a more recent investigator has brought forth proof that the spleen produces a hormone substance which stimulates the secretion of gastric juice. The opinions of different investigators have varied in respect to the effects produced after splenectomy on the blood picture, but the majority of results usually show a slight but transitory polycythemia which does not amount to more than an increase of one to two million reds and not lasting over five to seven days. Then there is likely to be an anæmia which may persist, or, as in the larger percentage of cases, a normal red count. In the white blood cells there is usually a slight post-operative leucocytosis followed by a permanent lymphocytosis of varying degree with an increased number of mononuclear leucocytes and eosinophiles. There will be no increase in polymorphonuclears unless there is some infection, as that resulting from pus in the wound. The author of the paper here presented another original chart obtained from a splenectomized dog which showed the above results.

Another one of the more recent ideas is that of Stradomsky, who claims that the spleen has a twofold hormone action on the bone-marrow. One of these he claims has an inhibiting action

on the production of red blood cells in the bone-marrow, while at the same time, the other exerts a stimulating action to increase the destruction of the red cells, the normal balance in the blood being brought about by these two factors. When the spleen hormone is absent, the bone-marrow produces unlimited quantities of reds but there is a deterioration in their quality. After splenectomy, injection of spleen extract is likely to give results confirming the action of the spleen, while spleen extract, in the treatment of anæmia, seems to contradict his views which he attempts to explain on the ground of biological reactions. However, it is quite probable that the spleen may furnish a substance of internal secretion which is important in the control of the bone-marrow in the production of the red cells, and if such a phenomenon exists it may rightly be considered as one of the emergency functions of the spleen.

The organ may be concerned in the manufacture of red blood cells. In fœtal life we know this to be a normal function, but in adult life all indications of such a function normally disappears, but it is a known fact, that after severe anæmias (pernicious anæmia) and in rabbits after the injection of saponin, the spleen may again take on its hæmatopoietic function and the venous sinuses become crowded with the cells of the marrow type, thereby giving an emergency function in the body of the greatest importance.

The seat of antibody formation has been proven rather conclusively to take place, not in the blood stream, but in the hæmatopoietic tissues of the body and especially in the spleen, as has been shown by experiments on dogs. When two such animals are selected and the spleen removed from one while the other is left normal, as a control, it is found that if goat's blood is injected into these two animals in equal amounts, which acts in each case as antigen, and then the rate of appearance and concentration of immune bodies determined, the normal dog with a spleen produces more antibodies than the splenectomized animal, the former acting on goat's corpuscles with a dilution of 1/98,304 after the fourth day, while the latter only acts after the twelfth day with a dilution of 1/6,144. This latter animal is also more susceptible to pathogenic organisms. Hence the organ has the power of producing antibodies which may likewise be considered one of the emergency functions of the spleen.

For many years it has been considered that the spleen was not a vital organ, and that its removal from the body was without

serious injury to the animal, since the splenic function could be so easily taken over by some other organ or tissue in the body. However, a recent communication by Luckhardt before the annual meeting of the American Pathological Society at Minneapolis, December 26th–29th, 1917, on splenectomy in the young of cats, seems to point rather conclusively to the fact that the spleen is a most vital organ, at least in the young. He worked on very young cats, selecting animals from the same litter and those which compared well in weight. All the splenectomized cats died young; the normals or controls nearly doubled their body weight, while the splenectomized lost in body weight. The adrenals in the splenectomized cats were nearly twice the size and weight of those in the normal, which indicates an intimate relationship between the spleen and the adrenal glands. Our knowledge of the spleen is as yet somewhat limited. We are just beginning to learn of its great importance to the body, and although not as well acquainted with its internal functioning as in the case of many of the other ductless glands, such as the adrenals and more recently the thyroids, whose active principle, known as "thyroxin", has just been isolated by Dr. Kendall of the Mayo Clinic and is soon to be placed on the market for the treatment of thyroid insufficiency, yet we may expect as great, or even greater, discoveries from investigations on the spleen.

Discussion: Dr. W. T. Connell: 1. My understanding of the action of the spleen in the disintegration of the red blood cells, is that in the spleen, the red cells are "marked" for distruction, probably by addition of a hæmolytic ferment-like or sensitizer substance, which then leads to the disintegration of these cells in any part of the circulation or their phagocytosis by macrophages. This has seemed to me to be the explanation for the removal of spleen advocated by some in pernicious anæmia cases during the improvement stage or following a successful blood transfusion. No doubt this function is shared by endothelial and lymphoid cells of the lymphatic glands and lymphoid tissue and this accounts for the fact that after extirpation normal hæmolysis is not greatly disturbed.

2. That the spleen is one of the important organs of the body in the development of antibodies against infection is, I think, generally agreed, and the pulp cells are actively phagocytic. Evidence of these functions are afforded by the common enlargement of the spleen in nearly all the acute infections, and in the

readiness with which bacteria or protozoa are picked out of the circulation by the splenic cells and thus are readily demonstrated in the spleen in fatal infections.

Dr. Third: Gustav Mann (New Orleans) has shown that 13,900,000 corpuscles per cubic millimetre is the maximum carrying power of the blood plasma.

In a patient recently under observation who had lived for some years at considerable altitudes the average of four counts was 8,200,000 per c.m. The viscosity was enormously increased. It seemed marvellous to me that such blood could pass through the capillaries. Before leaving the mountains he said he was of a "bad colour", presumably cyanosed, that he felt "dopey" most of the time, and suffered almost daily from headaches. Five weeks after his return to normal levels the count was only slightly above 6,000,000 and his general condition was good.

We have been taught to regard this polycythæmia as compensatory, as in fact, but another example of "adaptation", and the case cited would appear to support this view. I do not think there is any case on record where this condition has merged into true erythræmia.

Dr. Wm. Gibson: Could the polycythæmia after splenectomy not be accounted for by the absence of the splenic hormones?

Professor Patterson, closing: I am fully aware of the phagocytic activity of the splenic cells and the remarkable work they accomplish in cleaning up the bacteria to which Dr. Connell has called our attention. In reply to his views on the destruction of the red blood cells by the spleen, I must take the stand of the physiologist, that they meet their fate in the blood stream or anywhere in the circulation, even before they reach the spleen. Of course the best proof we have that the spleen destroys the erythrocytes, is the histological fact that in teased preparations of the spleen tissue or of the lymph-glands, certain large cells (macrophages) contain red blood cells in their cell substance in various stages of disintegration These large cells probaby ingest the red blood cells, selecting those, presumably, that are in a state of physiological decline. Against this idea, a number of objections may be raised. Leucocytes with ingested red blood cells are not found frequently nor so constant as one would expect. It has also been found that the blood of the splenic vein contains no hæmoglobin in solution, which indicates that no considerable dissolution of red blood cells is taking place in the spleen. Neither does complete extirpation of the spleen seem to lessen materially

the normal destruction of the erythrocytes, if we measure the extent of bile pigment formed in the liver, since hæmoglobin is the mother-substance from which the bile pigments are derived, but I cannot absolutely say, that the splenic function of destroying these blood cells which so many clinicians believe in, may not be taken over after splenectomy by some other organ or tissues in the body. The production of antibodies by the spleen is most interesting and well founded and of great importance to the body.

I agree with Dr. Third that polycythæmia leads to a marked increase in the viscosity of the blood and that death results when the 13,000,000 mark is much exceeded. As the viscosity of the blood increases with the increased polycythæmia, of course the oxygen carrying capacity of the blood is also diminished, and in order to meet the demands of the body tissues the blood would have to circulate more rapidly, but this is impossible, due to greater resistance from viscosity.

As to Dr. Gibson's question in regard to the cause of polycythæmia after splenectomy being due to the absence of the splenic hormones, I think this is a very reasonable conclusion for one to draw, provided Stradomsky's results can be relied upon, but of course his work needs verification.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

The fifth regular meeting of the society was held Friday, December 7th, 1917, Dr. A. E. Garrow, president, in the chair.

Case Report: Dr. L. M. Lindsay exhibited a case of rheumatic fever with purpura and œdema, a report of which appears on page 352 of this number of the Journal.

Discussion: Dr. G. G. Campbell: I was asked to see this case at the time tracheotomy was done and when the purpura was at its height. It seemed to me then, and I still think, that the eruption was not of the type one gets with rheumatic purpura. There are several points against it to which I think one should give prominence. Purpura occurring in connexion with rheumatism is generally symmetrically distributed; it does not occur, as in this case as you can see from the photographs, in the dependent parts of the body. In the curve where the folds of the buttocks come together there is almost a straight line where the margin of the hæmorrhage begins, and about the shoulders and back the same thing is true. In most purpura cases the limbs are much more affected than the trunk and the distribution is

fairly symmetrical. It therefore gave me the impression that this was a case in which the salicylate of soda had caused some change in the composition of the blood so that it passed through the walls of the vessels wherever there was pressure, such as we see occurring often in certain cases of urticaria. The other case Dr. Lindsay referred to was a man who had rheumatic iritis in the care of Dr. Stirling. He was put on small doses of the salicylate of soda and developed hæmorrhages. The salicylate was continued and ulceration occurred. The hæmorrhages were very large and very regular and showed little evidence of symmetry, except so far as they could be induced by pressure. From the view of the dermatologist this case of Dr. Lindsay's was much more like a salicylate of soda eruption than purpura rheumatica.

Dr. A. H. Gordon: It seems to me that one is very apt to make the name rheumatism a cloak for a great many conditions, of the character of which we have no real knowledge. One sees a great many cases of rheumatic fever with the syndrome of multiple migratory arthritis, fever, endocarditis, sweating, etc., and in none of these cases that one sees so frequently do we see any such things as purpura, iritis, rheumatic eyes, rheumatic sore throat, rheumatic pains in the back, etc. When one does see purpura as a rule it is not associated with a typical rheumatic fever, neither is iritis, nor erythema nodosum, and therefore it seems to me that the burden of proof rests on any one who wishes to call such conditions rheumatic. It does seem to me that it is quite open to question whether any of the aforementioned conditions have any right to be referred to as rheumatic.

Dr. H. B. Cushing: I saw this case on admission and it was hard to avoid the conclusion that she had acute rheumatism; there was fever, polyarthritis, endocarditis, and all the other cardinal signs. In addition she had this most unusual rash which was totally unlike any I had seen of the so-called rheumatic purpuras. I was inclined to welcome the suggestion that the condition was due to the salicylates. However, after salicylates had been stopped and the purpura disappeared, two weeks later she had a recurrence of purpura without any salicylate. She was also given salicylates on another occasion when there was no rash, without it recurring. This to my mind was strongly against alteration of the blood by the soda salicylate.

Pathological Specimens: Series by Dr. W. J. Scott.

1. Fractured crest of the left ilium with thrombosis of left iliac vein; pulmonary embolism. The patient had fallen a dis-

tance of twelve feet and the fracture was treated on admission to hospital. Ten days after, patient insisted upon leaving hospital and while dressing fell to the floor dead from pulmonary embolism.

2. Lympho-blastoma with its origin in the spleen; secondaries in the glands of the cervical region and hilus of the spleen.

Discussion: Dr. C. K. P. Henry: The first case mentioned by Dr. Scott was a patient in Dr. von Eberts' ward and one of the symptoms was a temporary hæmaturia. At autopsy it would appear from the swelling and the callus, and the damage there, that it would be possible for the ureter as it crossed over the brim of the pelvis, to have been temporarily injured or contused and would probably have been the cause of the hæmaturia. The man presented the ordinary symptoms of this fracture but it is rather unusual to get such a displacement of such a large portion of the crest without any accompanying injury of the rami or the bones in the front. The man was intoxicated, and difficult to handle all the time he was in hospital and insisted upon getting up against the will of the attendants.

Dr. Lauterman: May I ask how this metastasis in the second specimen travelled from the spleen to the neck without involving any of the other organs on the way.

Dr. A. E. Garrow: What was the relation between this injury and the condition of the iliac vein? I was not clear whether it had been injured at the time of the accident or subsequent to the slipping of the bone by his movement.

Dr. A. R. Pennoyer: I would like to ask whether in this first specimen there was any evidence of thrombo-phlebitis because it appears to me that a condition so extensive as this would have given some evidence in the leg, œdema, etc.

Dr. W. J. Scott: These metastases may travel through the blood stream by their own amœboid movement or by a tumour infiltrating a blood vessel, or they may travel by the lymphatics. In this case it would seem that it was by the blood stream. As to the bone case the internal iliac vein showed no evidence of violence but the branches were thrombosed and there was evidence of a thrombosis of the vein itself. There was no evidence of infection.

Paper: The paper of the evening was read by Dr. H. B. Cushing on, "Recent cases of epidemic meningitis in Montreal," and discussed by Drs. Gurd, Lindsay, Hall, Campbell, and Gordon. Dr. Cushing replied.

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The Canadian
Medical Association Journal

Vol. VIII. MAY, 1918 No. 5

PANCREATIC CYSTS

By W. F. Hamilton, M.D.

Montreal

WHILE this subject is of interest more from the standpoint of the pathologist, the physiologist and the operating surgeon, than from that of the therapeutist, I am prompted to discuss it to-day from the point of view of diagnosis, which must be admitted is of first interest to all.

During the last ten years, three cases have been admitted to my service. These with another, permission to report which has been kindly granted by Dr. Keenan, form the substance of this brief paper.

Case 1. A female, aged sixty-one, was admitted in May, 1913. She complained of attacks of pain in the right side of the abdomen, through to the back and to the right shoulder. She had suffered from "one thing or another" for many years, but her first attack of abdominal pain was experienced four years before her admission. She had needed morphine occasionally for relief, and was at one time jaundiced. A few months before admission her attack had been specially severe, jaundice again appeared, and clay coloured stools were noted. When she was admitted, the examination showed that she had lost some weight, her normal weight being one hundred and ten, her present weight ninety-six. The chief interest centred about the examination of the abdomen. Here one found a thin lax abdominal wall, with irregular undulations just below the umbilicus. A little to the left of the middle line and above the umbilicus was a mass, tender, slightly moveable, with respiration, and on palpation, the note over which was that of dull tympany. The liver and the spleen were not palpable. There was no sign of fluid. The other systems were negative. On

subjecting this patient to an *x*-ray examination with the aid of a barium meal, the stomach was found displaced to the left and downwards, its transverse measurement shortened with the greater curvature lengthened and presenting a very sharply defined outline. It was clear that this mass was not in the stomach. The diagnosis with the help of the *x*-ray examination was that of an extra-gastric tumour, most likely a cyst of the pancreas. The patient was operated on by Dr. Armstrong, a median incision being made above the umbilicus. A cyst was discovered which occupied the body and head of the pancreas, the stomach lying to the left side and somewhat in front of the mass. Six ounces of greenish brown fluid of soapy consistency was aspirated, a tube inserted into the cyst cavity, and the abdomen closed. The gall bladder and passages were free, and there was no evidence of duodenal cancer. The cyst fluid contained pancreatic ferments and bile. The patient made an uneventful recovery and was discharged June 17th, 1913. A specimen of tissue from the operation was examined in the pathological department, where but little could be made out as to its origin. The diagnosis of "degenerated tissue" was returned. In this case there is the history of recurring attacks of abdominal pain, slight emaciation, vomiting, jaundice, clay-coloured stools (no history of injury). The presence of a round tumour displacing the stomach to the left was the main physical feature in the case.

Case 2. (Med. Case No. 22142). Male, aged forty-four, was admitted to the hospital January 21st, 1915, with a history of but two months' duration. His complaint was of short, sharp pains in the left side of the upper abdomen first noticed while ploughing. He continued his work until about two and a half weeks before admission, when by reason of the increasingly severe pain he was unable to go on longer. At this time also his abdomen was evidently larger than normal. He lost weight and colour. His past history was free from any suggestion or indication of a cause for abdominal pain, no injury, no stomach disturbance, no diarrhœa. He had never been jaundiced. The abdomen was distended asymetrically, the left side being more prominent than the right. The fulness was largely in the left upper quadrant where a mass, soft, somewhat irregular, and slightly pulsating could be seen and felt. It was movable with respiration, the percussion note over the mass was impaired. By the aid of the *x*-ray and barium meal, the stomach was found displaced and lying across the abdomen. While the stomach emptied normally

yet it appeared from the very varying amount of barium at different places, as if its wall were irregular, "hitched up" and formed into pockets. In this case the mass was below the stomach and above the transverse colon. The patient was operated on by Dr. Garrow, an incision being made through the left rectus. A cyst bounded in front by the gastro-colic omentum and below by the transverse meso colon, externally the gastro-splenic omentum and layers of ascending colon, was discovered, presenting a haemorrhagic appearance. A large quantity of chocolate-brown fluid more or less haemorrhagic in character, was evacuated, the sac packed with gauze and a drain inserted. The fluid was examined and found to be alkaline in reaction and to contain trypsine, lipase and amylase, with free blood pigment. The patient remained in the hospital for several days, and was discharged considerably improved.

The abdominal wall healed up. In the course of a few weeks, however, the cyst refilled, the wall gave way, the patient died through inanition.

In review we may state that the case was of short duration, the development of a tumour rapidly ensued after the onset of pain, there was no history of injury or of jaundice or vomiting. Emaciation was not pronounced until near the end, and no evidence of malignant disease was discovered.

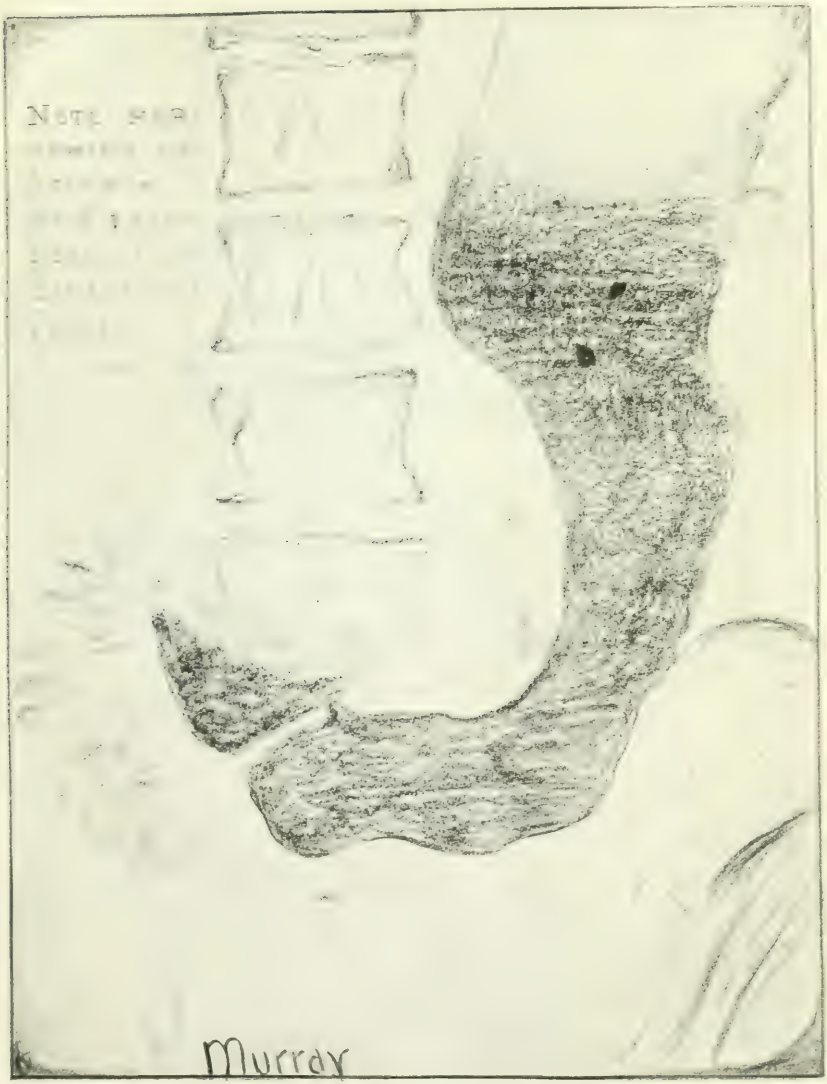
Case 3. (Med. Case No. 25244). A male, aged sixty-seven, was admitted on February 17th, 1917. He stated that he had been well until the middle of January of this year, although he had felt slight pain in the abdomen about the umbilicus from time to time following the first of the month. After a half day's heavy work on January 15th, and a hearty meal, the patient suffered intense pain early the following morning. No further symptoms marked the case beyond feeling that his abdomen was not quite right on passing his hand over the upper quadrant where a fulness was discovered. Another attack of pain succeeded in about three weeks, the lump at this time, as he described it, being somewhat larger. He had slight discomfort after eating. He had never been jaundiced and while his stools were occasionally pale, nothing more had been remarked concerning them. This patient aged sixty-seven looked about forty-seven years old. There was little or no emaciation; save for slight traces of albumin in the urine, the systems were normal, with the exception of the digestive tract. Immediately beneath left costal margin, a smooth mass was discovered on inspection,

well above the umbilicus. It had a firm feel, giving the sensation of tension rather than solidity. It moved slightly with inspiration. The percussion note over it was faintly tympanitic. It came out from under the left costal margin, and presented a well-defined, rounded edge, an inch and a half below the ensiform cartilage in the middle line. It was at first thought that we were dealing with an extensive cancer of the stomach, but on going more thoroughly into the case aided by the barium meal and *x*-ray, it was evident we were dealing with a mass outside this organ. The stomach was plainly displaced to the left, its greater curvature greatly elongated, its central measurement markedly shortened as shown in the figure. The stomach was above, to the left, and below the tumour. A very marked filling defect which seemed permanent was noticed in the lesser curvature. The patient was operated on on February 17th, by an incision through the left rectus, revealing a large cystic mass pushing up the gastro-hepatic omentum. The cyst was opened and twenty-six ounces of dirty brownish black fluid removed. Scattered over the cyst's wall were a number of very hard shotty masses suggesting malignancy. Drainage tube was inserted in the cyst and the abdominal wall closed. At the end of three weeks the patient was discharged with the drainage tube still in. By an unfortunate oversight the fluid was not examined. The chief points to be noted in this case, are the severe attacks of abdominal pain, remote (forty-three years ago) injury to the abdomen, the absence of jaundice and vomiting, and the comparatively short course before a well-defined tumour was present.

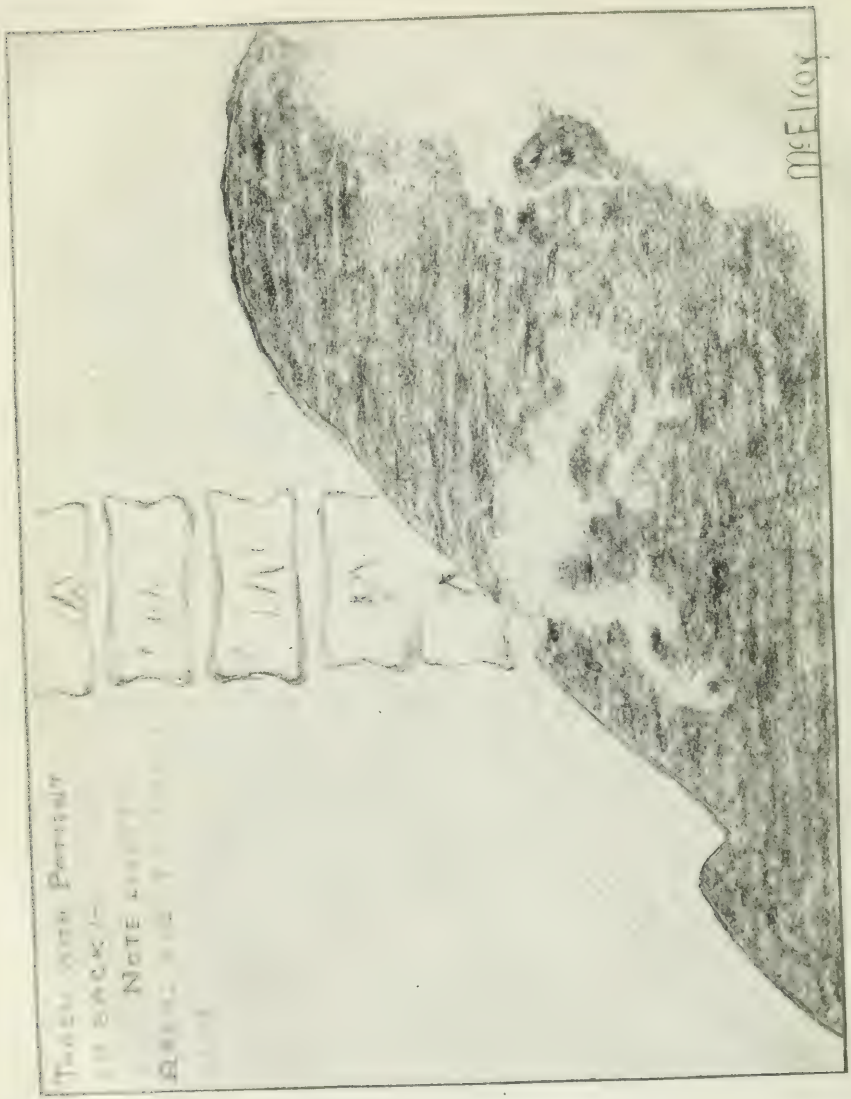
When last heard from June 13th, there was still a fistulous opening, yet the general condition was good, the patient eating well and going about.

Case 4. (Surgical case report 20343). A female, forty years of age, had complained of pain for four years in the left upper quadrant. Two and a half years before admission, signs of increased abdominal tension were noted. There was little to remark here beyond the physical examination of the abdomen, which was full, rounded, presenting a left sided prominence. There was a large hard mass occupying the whole of the left upper quadrant, passing to the mammary line on the right side and down below the umbilicus to the distance of two inches in the middle line. The left upper portion of the mass was hidden by the costal margin. The mass was smooth, freely movable from side to side, distinct from the liver dulness, and though the difference between the

CASE No. 1



CASE No. 2

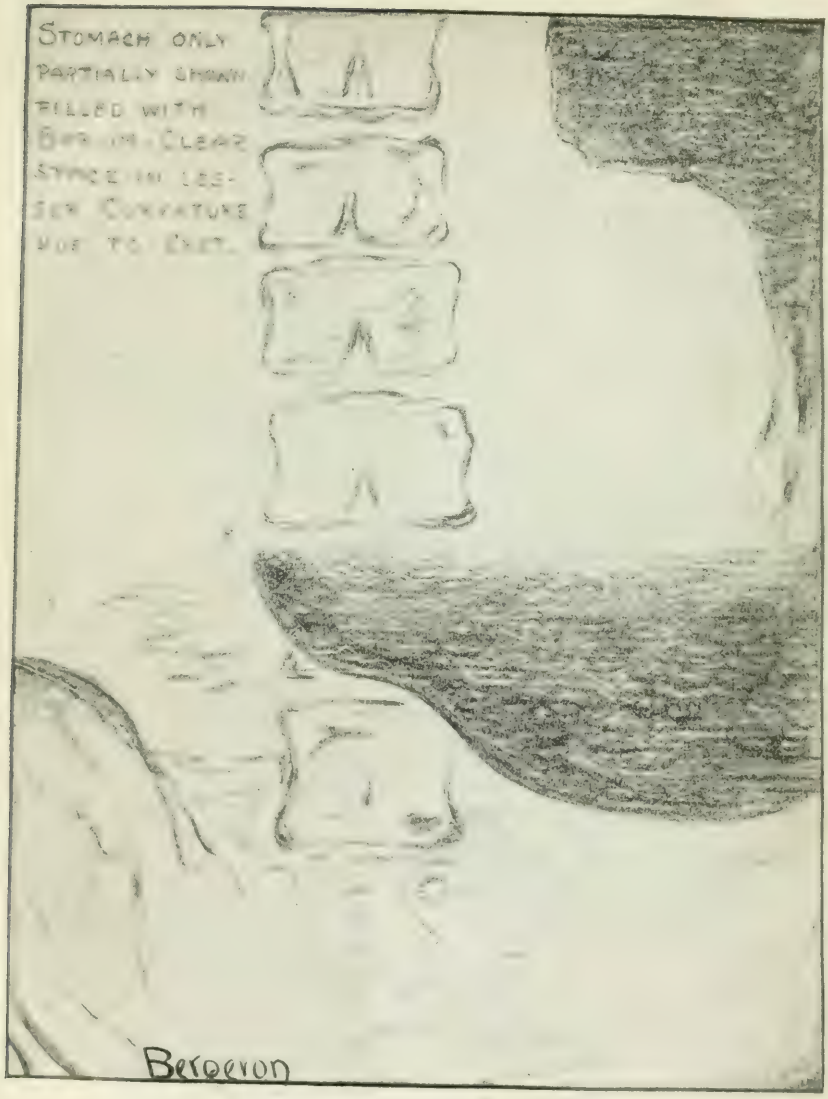


CASE No. 2

Stomach partially filled with barium

*Irregular area of shadow due to pressure of tumour (cyst)

CASE No. 3


STOMACH ONLY
PARTIALLY SHOWN
FILLED WITH
BARIUM. CLEAR
SPACE IN LES-
SER CURVATURE
DUE TO ENLT.
Bergeron

splenic dulness and that of the mass could not be made out, no notches were found anteriorly. Patient was operated on, on December 5th, 1916, without previous *x*-ray examination. Incision was made in the middle line above the umbilicus, the mass was exposed with the stomach lying above it and the transverse colon below. Eighty ounces of fluid of yellowish brown colour, was aspirated, the cyst wall containing a few small cysts filled with opalescent gelatinous material. The cyst was found to extend down to the pancreas, and too close to large vessels for removal, so the wall was sutured to the abdominal wall and a drainage tube inserted. The patient was discharged in May, and readmitted again in September on account of refilling of the cyst. The operation on this occasion revealed a condition practically the same as that previously described. It was noted at this time, however, that the pancreas was practically wholly involved in the cystic process. After several weeks during which the patient showed a very febrile temperature she was discharged, and since has been lost sight of. A diagnosis of retention cyst of the pancreas was made.

In this case the history was protracted, the cyst large and involvement of the pancreas very extensive. In the course of the treatment patient showed considerable emaciation, the weight being reduced from one hundred and forty-seven to one hundred and twenty. There was no history of jaundice or of vomiting, or of the characteristic stools or urine indicating pancreatic disease. The diagnosis was made from the physical signs entirely. In this case the stomach lay above the mass.

A diagnosis of cyst or tumour of the pancreas cannot be made from the symptoms. Indeed many physical signs referable to disturbance of pancreatic functions are usually wanting. Pale, bulky stools, sugar in the urine, emaciation, and, as French points out, jaundice from time to time.

The common symptom in this small group of cases was pain—described as short, sharp, and recurrent, intense, requiring morphine in considerable dosage.

Pain, as Opie points out, is of little diagnostic value. Jaundice was found in but one of the cases. This was not present when the diagnosis was made. The history of the cases alone affording the evidence. In one case only, nutritional changes were marked. The patient (Case 4) lost twenty pounds in the year previous to operation.

The stools and urine in none of these cases gave any suggestion

of pancreatic disease up to the time of operation, although no examination was made for ferments.

The character of fluid from these cysts at the time of the operation is described as "greenish brown soapy," "yellowish brown" with opalescent gelatinous material, "chocolate brown", "dirty brownish". In the two cases examined, pancreatic ferments were found in the fluid. By an unfortunate oversight, the contents of the cysts in the other cases were not examined.

Regarding enzymes in the contents of the cyst, Opie may be cited as saying that "it is often possible to demonstrate one or more of the three well-known enzymes of pancreatic juice in the contents of the pancreatic cyst, but proteolytic, lipolytic and diastatic enzymes have been found in the fluid removed from abdominal cysts which have not had their origin in the pancreas." Our experience bears out the truth of G. Newton Pitt's statement that physical are more important than rational signs in establishing the diagnosis of a cyst of the pancreas.

The position in relation to other organs, and the "feel" of the tumour as made out in palpation, are most important. It is well to remember, however, that the mass is frequently moveable both upon pressure and with respiration. Contrary to the teaching found in a few of our text-books, the mobility of a pancreatic cyst may be considerable. Admitting that the mobility of a cyst of the pancreas cannot compare with that of a mesenteric cyst, yet one cannot agree that "in rare cases it may be feebly" *moveable* in consequence of its attachment to the tail of the pancreas by a narrow pedicle.

One object in bringing forward this subject to-day is that of laying emphasis on the great advantage in diagnosis resulting from a careful *x*-ray examination by the aid of the barium meal. The sketches, presented herewith, illustrate the relation of the tumour to the stomach.

CHOLECYSTECTOMY—A USEFUL TECHNIQUE

By F. N. G. Starr, M.B.

Associate Professor of Clinical Surgery, University of Toronto

AND

Roscoe Graham, M.B.

Assistant in Clinical Surgery, University of Toronto

WHILE one of us is the son of the parsonage, yet he has never been a strong believer in the eleventh hour conversion; at the same time he realizes that such is better than no conversion at all. The process by which we have wandered from a strong predilection for cholecystostomy to a decided preference for cholecystectomy has been gradual and we think is based upon a sure foundation. We shall have more to say of this in the spring when we have had a chance to tabulate some results and to conclude some animal experiments now being undertaken.

Some surgeons claim that the gall-bladder should be removed only when there is a definite pathological lesion, such as hydrops, calcareous or fibrous degeneration, chronic empyema, strawberry gall-bladder, carcinoma, extensive laceration, or perforation. We, however, frequently see a gall-bladder which on inspection looks normal and on palpation feels normal and empties readily, and yet if removed, we find in the submucosa an infection with a beginning fibrosis. For example, recently one of us removed the gall-bladder in a child of one and a half years, suffering from glycosuria. It seemed a sin to do it, and yet upon culture we obtained a staphylococcus aureus, and found fibrosis microscopically.

One of the most potent factors in our conversion was a series of cases that fell into our hands, in whom drainage had been done by other surgeons, or by one of us. Some of these at the second operation had stones, that had either been overlooked, or had reformed from the persistence of the old infection, even after drainage; but all had the most infernal adhesions, necessitating a

*Read at Section of Surgery, Academy of Medicine, Toronto, November 20th, 1917. Received for publication March 5th, 1918.

very difficult and dangerous dissection to reach the source of trouble and remove the gall-bladder. Then two cases from whom stones had been removed and drainage established came under observation, with a recurrence of symptoms, only in an exaggerated form. In these two a diagnosis of cancer was made and verified at operation. Had cholecystectomy been done at the first operation, the cancer would probably have been cured without the knowledge of its presence.

We find a definite diminution in the morbidity in cholecystectomy, and no increase in the mortality. When this statement is made, it should be clearly understood that, to attain such results, the operation must be done by a surgeon and *not* by a "commission" merchant.

One requires an incision that will give easy access to the gall-bladder as well as the opportunity of exploring the ducts. With this object in view, we begin below and to the right of the ensiform cartilage, and parallel the costal margin, until opposite the outer border of the right rectus, and then direct the incision vertically downward. Two cross scratches are made with the back of the knife at the prominent point in each curve. The rectus sheath is reached and opened from one end of the incision to the other. The fibres of the rectus are then separated, when the posterior rectus sheath together with the peritoneum is opened. Any adhesions are divided, and the field is then carefully packed off with gauze strips soaked in saline. The gall-bladder and the ducts to the ampulla are then carefully explored. The peritoneum about the neck of the gall-bladder is nicked with a sharp knife, and is stripped down along the cystic duct by means of a small gauze "push" in a pair of forceps. The cystic duct and cystic artery are then clamped across with a pair of Kocher pointed forceps with a slight curve, another pair is clamped across the duct just above, and with a sharp knife the duct and artery are divided between the forceps. A small curved round needle, armed with a piece of No. 2 iodine catgut is then passed around the artery and tied beyond the point of the forceps. This same suture is continued through the peritoneum and through the duct, keeping close to the forceps. These are then slipped out from the loops, and the suture drawn tight and again tied. Continuing with this suture, the redundant peritoneum is then picked up and puckered over the stump of the duct. One then makes tension on the forceps at the neck of the gall-bladder, and by means of a few touches with the knife, the gall-bladder is stripped from its bed. As it is detached, our suture, which was

left long, gradually follows up, catching the serous margins on each side of the gall-bladder fissure, so that when the fundus of the gall-bladder is detached from the liver margin, another stitch completes the closure of the fissure.

This suturing and ligaturing has all been done with the one double strand of catgut. The wound is then dry and usually may be closed without drainage. If for some particular reason we decide to drain, we use a split drainage tube, with the end cut into four tails and containing a piece of gauze in the lumen, which is carried down over the stump of the cystic duct, two tails going on each side of the common duct, and the wound closed. We usually remove the tube on the second or third day, if there has been no leakage of bile. As a rule there is none. The wound usually heals by first intention, and the patient is on her way home in two weeks, sometimes less.

If operating in the presence of many adhesions, when one is closing the gall-bladder fissure a small piece of omentum may be laid into the fissure so that, when the duodenum again comes in contact, there is little chance of adhesion. If some other surgeon requires to open that belly for some future trouble, he will find we have left him a clear field to work upon.

1. Miles Porter—*Annals of Surgery*, September, 1917.

A danish doctor in a French hospital has invented cardboard legs for amputated limbs. The urgent need of cheaper and lighter material, on account of the great number of men who are being brought back from the trenches, evolved the novel idea. Two sheets of cardboard about the thickness of three-sixteenths of an inch are employed with bandages soaked in a starch solution. Careful measurements are taken and the cardboard is cut into what resembles two peg tops, which, after being soaked in the bath, fold round each other and are secured with bandages. The principle is that of an egg in a cup, and the patient can wear the leg long before the wound is healed.

NOTE ON THE HANDLING AND AFTER HISTORY OF HEART AFFECTIONS IN SOLDIERS*

By J. C. Meakins

Major, C.A.M.C.

THE army has, unfortunately, in their classification of heart affections in soldiers adopted the terms V.D.H. and D.A.H. Under the former are usually classed all cases with cardiac murmurs and under the latter those cases having no cardiac murmurs but certain symptoms which are supposed to result from what is commonly called "cardiac insufficiency". I say unfortunately, because neither of these symbols mean what they indicate. A small percentage *only* of the cases having cardiac murmurs have valvular disease and even a smaller percentage of the cases of D.A.H. have a "disordered action of the heart". It is quite a common occurrence for a soldier to be diagnosed V.D.H. when there is merely a systolic murmur heard over some part of the cardiac area which, standing by itself, indicates nothing. Furthermore, many such cases were in good condition when this murmur was accidently discovered. The diagnosis of V.D.H. has made a profound impression on the soldier's mind. For the first time he realizes he has a heart and very likely he will never forget it: in spite of considerable argument to the contrary.

So it is with the case of D.A.H.: comparatively few of them have any real disorder that can be attributed directly to the heart. The vast majority of these cases have a regular pulse, although maybe a little faster than normal. In these patients none of the graver signs of heart affection can be detected but there is complaint of breathlessness, palpitation, giddiness or actual fainting, easy exhaustion, and præcordial pain in varying degree: symptoms arising for the most part upon exertion or exaggerated by it.

It has been our object in the past year at the Hampstead

Read at the forty-eighth annual meeting of the Canadian Medical Association, Montreal, June 15th, 1917.

*The text of this paper is based on the work done by the Medical Staff of the Hampstead Military Hospital under the direction of the Medical Research Committee.

Military Hospital to try to determine the value to the army of men suffering from the above symptoms, and to attempt to sort them into various categories of fitness or unfitness for duty.

I think it will be granted by all that the value of a soldier to the army depends primarily upon his ability to accomplish a given amount of exertion without being incapacitated. Therefore, in so far as the efficiency of a soldier is concerned, the chief point to dedetermine is: How much work is he good for? On this point will his classification depend. Therefore, in all cases of heart affections or those having symptoms which are commonly attributed to cardiac inefficiency, this is the main objective. In other words, what is the particular soldier suffering from and in view of the condition present, what is he actually capable of doing?

When first cases of V.D.H. and D.A.H. come under observation a concise but at the same time searching history should be taken and a physical examination made. At this point occurs the first sifting. In a certain number of cases one of the following conditions will be found:

1. Aortic disease.
2. Mitral stenosis and aortic disease together.
3. Mitral stenosis.
4. Myocardial disease with or without enlargement and with or without mitral incompetence.

The first three catergories require little comment, as these patients all present unmistakeable signs of grave structural alterations in the heart. The fourth category is less clearly defined, and comprises:

(a) A number of patients in whom there is unmistakeable and considerable enlargement of the heart with or without mitral incompetence. In estimating enlargement, it is well to be guided by the maximal point of pulsation at the apex and not so much by percussion. Diffusion of the impulse to one or more rib spaces, or an impulse four inches from the mid-line, are not regarded as of grave importance if they occur alone, and especially is this the case in men who are heavily built, or in whom the heart action is rapid during the examination.

(b) Patients in whom there are grave disorders of the heart's action, with or without enlargement of the organ. These are rare, the most notable examples being those in whom gross irregularity is constant from hour to hour and from day to day, and in whom the irregularity is accompanied by rapidity of the heart's action while the subject is at rest. They are examples of fibril-

lation of the auricles. A few patients will be found in whom auricular flutter and heart-block are discovered by instrumental examination. There are two further forms of irregular heart action which we encounter in a large proportion of our patients. The first is *extra-systolic irregularity*, giving rise to intermittent pulse or simple groupings of the pulse beats and an irregularity which may be identified when respiration is deepened, for it then consists of a waxing of pulse-rate during the inspiratory period and a waning during expiration. These two forms of irregularity are easy to identify by ordinary methods of examination and when identified should not, in our opinion, influence the category in which the patient is placed, or the question of discharge. All patients who present them are dealt with as though such signs were absent, attention being centred upon the remaining signs and symptoms.

(c) A high percentage of the fourth group is formed by patients in whom a systolic murmur is audible at the apex. When this murmur is harsh in quality and well conducted to the axilla and is at the same time associated with (1) an exaggerated first heart sound and accentuated or reduplicated second pulmonic sound, (2) a thrill, (3) a history of recent rheumatic fever or of two or more attacks of rheumatic fever, (4) severity and persistence of symptoms: it is considered with its associations to be of importance. Standing by itself, a systolic murmur is not considered significant, whatever the character of the murmur: in our experience many men who present this sign are capable of a great deal, if not of full and continued effort.

(d) Rare cases of severe cardiac pain, radiating to the left arm.

All these cases are obviously suffering from a grave condition of the heart itself. The treatment of such cases is, naturally, the same as in civilian life. We all know the limitations of civilians suffering from these conditions, which limitation is proportionately greater in a soldier.

The disposal of these men is a matter of policy more than a medical question. It is now understood that they shall be discharged from the army as soon as recognized.

The signs to which we attach little or no value in the first sifting of cases it may be well to tabulate: they are:

1. Extra-systolic or respiratory irregularity.
2. Simple acceleration of the heart's action.
3. Diffusion of the heart's impulse.
4. Short soft systolic murmur at apex.
5. Systolic murmurs in the aortic or pulmonic region.

Second Sifting. It will be evident that we carry over to our second sifting some patients who have comparatively insignificant organic lesions and their eventual disposal will depend upon their symptoms on exertion more than upon the physical signs. In our second sifting we are dealing in the main with patients in whom no clear signs of organic disease are discoverable, these are the patients to whom is applied the term D.A.H., that is to say patients who have symptoms but in whom no sign which we regard as a trustworthy sign of organic heart mischief can be discerned at the first or subsequent examinations. It is in respect of these patients that disagreement as to their eventual fitness for service is likely to arise. Therefore, it will be well to go into the character of these cases in some detail.

It is difficult to find a suitable name for such cases. At first we were inclined to call them cases of "irritable heart", a term less comprehensive than soldier's heart and yet more comprehensive than D.A.H. But we feel that this is not without serious objections as it implies a condition connected with some disorder of the heart itself of which there is no proof at the present time, as I will later try to show. We would much rather see used a term as "debility" or as the French have so aptly described these cases as "fatigue".

As I have stated above the cardinal symptoms are dyspnœa, palpitation, dizziness even to fainting, præcordial pain and fatigue. These symptoms may be present more or less continuously, but as a rule are produced or aggravated by exertion.

Many definitely date their symptoms from the time they first got out of bed, or in other words first exerted themselves after an infection such as rheumatic fever, dysentery, trench fever, pneumonia, the exanthemata, etc. Some cases date their symptoms definitely from shell shock or gassing and in these the onset of the above symptoms is usually quite sudden. Very few cases date their condition from severe physical exertion alone. But the combination of mild or severe infections with exertion, shell shock, bombardment, gassing, account for a large proportion of those whose symptoms commence during their military career.

A most important fact to be borne in mind, particularly by those responsible for the medical examination of the recruit, is that 43 per cent. of all patients invalided for this condition have had these symptoms prior to enlistment, and 12 per cent. acquired their first symptoms on training. Therefore, any soldiers who report sick for these symptoms should be carefully watched during

their training in order that they may not be sent on active service, for which they are palpably unfit. It has been my experience that these men, if they are enlisted, are given sedentary occupations in their regiments and are excused training. This is not conducive to making the man fit for service and when later placed on full training he promptly reports sick and may become an invalid in England unfit for active service. These cases, immediately their condition is known, should be dealt with as if they were patients and not despatched from Canada until it be proven by tests of actual exertion that they are fit for the rôle they will be called upon to play on active service.

As to the pathology of this condition, I have to acknowledge that we have been unable to solve it as yet. There is no evidence that this is a morbid condition in the usual sense of the word, but there is considerable evidence to lead us to believe that it is the normal condition unduly sensitive to exertion. First consider the commonest symptoms, dyspnœa and tachycardia (palpitation). During sleep the respiratory rate and pulse rate in these patients are normal. Therefore during absolute rest these functions are undisturbed. Similarly with the sense of fatigue, when at rest this is absent. It has been claimed by many that there is cardiac enlargement. But in fifty unselected cases which have been examined with the orthodiagraph, there has been no increase in the cardiac measurements, in fact the heart, if anything, is slightly smaller than normal.

As exertion produces symptoms it is reasonable to look for abnormal conditions resulting from exertion. We have made many observations before and after various exercises upon the pulse rate, blood pressure, respiratory rate, differential blood counts, quantitative blood counts, size of the heart, urinary acidity, various other urinary examinations, change in alveolar air, CO_2 toleration, chemistry of the blood, etc. In all of these examinations there is a variation from the normal in proportion to the severity of the symptoms produced by the exertion, *but*, if normal or healthy men are given sufficient exercise to produce symptoms of similar severity, then similar deviations from the normal are obtained.

In other words if:

A severe case does one unit of work.
A moderate case does two units of work.
A mild case does five units of work.
A normal man does ten units of work.
A trained athlete does twenty units of work with the same

symptoms, then the same changes will be observed in their pulse and respiratory rate, blood pressure, etc. In other words these changes after exertion are quantitative and not qualitative.

From the standpoint of the army, the pathology of this condition is at the moment of comparatively little importance, but a reliable method to determine the relative fitness of such men for duty is imperative for army medical officers. At an early stage we found it impossible to arrive at a satisfactory conclusion from the physical signs or consideration of the history. Consequently we instituted a series of test exercises upon which all such patients are placed. The exercises adopted are a selection from the code of army exercises. These offer many advantages: they are directed by a sergeant instructor thoroughly conversant with them, and in a position to maintain discipline amongst the men: they are in a large measure familiar to the men: they are exercises which many of the men who return to their depots will be called upon to undertake.

The individual exercises are grouped under the headings A and B and C (first part and second part), each of which occupies fifteen minutes, and under D.30 which occupies thirty minutes. The exercises are taken daily and in favourable instances a patient moves to a higher grade exercise after three or four days. He moves from A to B to C to AB (thirty minutes) to BC (thirty minutes) to C.30 (both parts AC) and finally to D.30. The objects of combining exercise groups in this fashion are first to decrease the work of the instructor (thus the three classes A, B and AB together occupy thirty minutes) and secondly, to use throughout the whole system relatively few exercises, so that they may be readily acquired and thoroughly learnt. Thus he passes through seven groups of exercises, in a scale of ascending severity. D.30 is eventually taken in combination with route marches of four or more miles without pack, with light pack, and finally in full marching order. Patients are examined after they first take a new exercise, or when they specially report themselves or are reported. Our patients gradually class themselves according to the highest grades of exercise which are borne without distress, and in estimating fitness for duty we are finally and chiefly guided by these tests. The appearance of a man coming from drill, his expression, his colour, his breathing, and excessive heart-rate (140-160) are invaluable clues to his tolerance of the exercise, and he is put forward or back, or maintained on his exercise after due consideration of these signs and his statement of his symptoms upon the exercises.

We have gone on the principle that a soldier's actual capacity to do the work is the only dependable test of his efficiency. Therefore, after eliminating cases with grave cardiac disorders of structure or rhythm we have classified all the remaining according to the amount of work they can perform without material symptoms. It is true that many of these cases have systolic murmurs but we have found that to be no indication of a soldier's incapacity to accomplish extensive physical exertion without distress, and feel that such physical signs should not be regarded as important.

Treatment. The benefit of carefully regulated physical exercises on these men is conspicuous. Both physically and mentally they improve in nearly all cases, particularly amongst those who have developed their symptoms on active service. The longer the history of the duration of the symptoms the less likely is the improvement to be sufficient to enable the soldier to be rendered fit for active service. Associated with physical exercises we have found occupations to be of benefit. Rest in bed, particularly for long periods of time, is undoubtedly detrimental. Many other remedies have been tried by us but without success.

Relation to Pensions. At first, cases which were unfit for active service at home or abroad were of necessity invalided from the army. But recently the reclassification for employment has allowed of these cases being retained in the service. But the disability in a small percentage only of these can be considered to be great in so far as civilian life is concerned. It has been found that these cases when they return to civil life can do a considerable amount of work averaging about forty-five hours a week. The disability should not be considered permanent, but a reëxamination and, if necessary, reclassification should be carried out at the end of the year.

THE DIAGNOSIS OF DISSEMINATED SCLEROSIS

By Arthur G. Morphy, B.A., M.D.

Assistant Demonstrator in Medicine, McGill University,
Clinical Assistant in Medicine, Royal Victoria Hospital,
Montreal

THE diagnosis of disseminated sclerosis, like that of most other diseases, is easy in well marked cases. A syndrome presenting intention tremor, nystagmus, ataxic and spastic paraplegia, pallor of the optic discs, extensor plantar reflex, exaggerated tendon reflexes, absent epigastric and abdominal reflexes, emotional disturbances such as uncontrollable laughter, with a tendency to alternate periods of exacerbation and remission of all or part of these symptoms, is unmistakeable.

Rarely, however, do we meet with cases showing a perfect picture. Indeed, one may say with truth, that in very many cases we do not find Charcot's classical triad of symptoms, namely, intention tremor, nystagmus, and scanning speech.

It is in the so-called aberrant cases in which only one or more of these leading features is present that our difficulties arise, and we are obliged to employ negative as well as positive evidence in our attempt to make a diagnosis.

That symptoms, motor, sensory, reflex and mental, should vary greatly in number, combination and intensity, is not surprising in view of the variation in localization and extent of the patches of sclerosis in the brain medulla and spinal cord.

And, to confuse matters still more, Strümpell and others have described cases of pseudo sclerosis in which pronounced symptoms of disseminated sclerosis existed during life, but no morbid changes were found post mortem.

The morbid changes found in cases of true disseminated sclerosis may be described briefly as follows:

Insular patches of overgrown neuroglia scattered throughout brain and spinal cord, situated principally in the white matter, and

Read at the forty-eighth annual meeting of the Canadian Medical Association, Montreal, June 15th, 1917.

of variable size and density. Large patches may extend over considerable portions of transverse sections of cord, medulla or pons. The largest patches are found in the white matter of the brain. Recent patches are softer and more gelatinous than normal tissue, while other patches are harder. The myelin sheaths of the nerve fibres involved in the patches have disappeared, the axis cylinders remaining bare. In some cases the latter have undergone degeneration. Ganglion cells remain some time and then fade away. The walls of the blood vessels are either normal or very little changed. A notable feature is the absence of ascending or descending degeneration in most cases. This distinguishes disseminated sclerosis from other conditions, such as disseminated myelitis and diffused syphilis in which multiple lesions are found.

While the patches are scattered irregularly throughout the nervous system, and any part may be affected, there are certain portions according to Erb which are especially liable to attack, namely the floor of the fourth ventricle, the walls of the lateral ventricle, the white substance of the hemispheres and the white tracts of the spinal cord.

The cause of disseminated sclerosis is unknown. Different theories have been advanced, but none proven. It is assumed that a so-called noxa or toxic body is diffused throughout the cerebro-spinal axis by the blood vessels or lymphatics.

Charcot held that the pathological process was a chronic interstitial inflammation leading to glia hyperplasia with secondary degenerative atrophy of the nerve elements.

Müller and Strümpell on the other hand have suggested that the process is endogenous, that is, that abnormally placed glia cells take on a vegetative activity with resulting glia hyperplasia.

Dawson, of Edinburgh, in an exhaustive article offers the following conclusions from his investigations.

That the underlying process is a subacute encephalo myelitis which ends in areas of sclerosis; that there is much in favour of the view that the disease is due to a specific morbid agent, probably a soluble toxin conveyed to the tissues by the blood stream, and that infectious diseases, cold, trauma, and physical shock predispose to the onset of the disease by lowering vitality and resistance; that fleeting early motor paralyses and psychic symptoms may be related to areas of sclerosis in association paths, and that remissions of these symptoms may be due to linking up of other association paths or opening up of new ones; that cortical areas share in the production of psychic symptoms, and that volitional tremor, al-

terations in speech and nystagmus may be the result of sclerosis spreading inwards from the ventricles and aqueduct.

It is difficult to believe that the symptoms in early cases result from stable morbid changes in brain and spinal cord, when one considers the remarkable remissions that occur. The hypothesis of a noxa affecting the nerve tissues primarily and producing increased glia formation secondarily through choking of perivascular spaces and lymph stasis is attractive.

A case illustrating complete remission of symptoms came to my notice in the out-patient of the Royal Victoria Hospital:

Jennie H., aged sixteen. Complaints. Loss of power in arms and legs.

History. In June, 1915, she noticed weakness and tremor of right hand, and could not write. After a month in the country these symptoms disappeared, but several months later returned. No other limb was affected at that time. The following summer she had the third attack. Vomiting was followed by marked weakness and tremor of right leg and arm. An interval of improvement was followed again by return of symptoms, and in December 1916, she came to the neurological clinic for treatment.

Present condition:—Cranial nerves normal. Coarse tremor both in arms and legs. Slight weakness in right arm, no wasting. Some spasticity in right leg. Incoördination by finger-nose test. No loss of joint sense.

Reflexes in arms, very brisk. Epigastric and abdominal absent. Knee jerks much exaggerated. Rectus and ankle clonus in both limbs. Plantars—extension right and left. No Romberg sign, but some unsteadiness in walking.

Cerebro-spinal fluid; Wassermann negative. Gold test, Noguchi, Nonne, negative. Cell count, twenty-nine.

Eyes, fundi normal.

The patient was admitted to the hospital and discharged after several weeks. She reported to the out-door clinic several times during the next six months, and all symptoms had disappeared. She had full use of her limbs, no tremor, no spastic gait.

Possibly the noxa itself may be directly productive of symptoms throughout the whole course of the disease, even when distinct sclerotic changes have occurred. I venture to hazard this theory as a possible explanation of the variation in symptoms. Dawson's idea of the opening up of new association paths seems inadequate to cover all cases.

Leaving theories aside and turning to practical matters, we

find that many and various symptoms have been grouped together under the heading of disseminated or multiple sclerosis. The leading group comprises Charcot's classical triad of intention tremor, scanning speech and nystagmus, to which I would join chronic ataxic paraplegia. A secondary group comprises emotional disturbances, psychoses, pallor of optic discs, optic neuritis, transient paralyses of external ocular muscles, affections of the optic, olfactory, trigeminal and hypoglossal nerves, epileptic and apoplectiform seizures, paræsthesias, weakness of upper extremities, increased tendon reflexes, absent epigastric and abdominal reflexes, extensor plantar reflexes, root pains, girdle sensation, bladder weakness, and finally decubitus with complete paraplegia.

The disease may set in suddenly, as after exposure to cold and wet, or gradually; many or few of the above symptoms may be present in combination; the disease may coexist with syphilis or dementia paralytica or hysteria.

In some cases a clinical differentiation from spinal syphilis, apart from serological evidence, is impossible.

That we cannot accept Nonne's opinion that intention tremor, nystagmus and scanning speech in combination are not found in cerebro-spinal syphilis, is proved by the following case:

Mrs. C. F. R., age twenty-four, admitted to hospital May 16th, 1917, complaining of shaking of limbs and head.

History of present ilness. Was quite well until two years ago. One day while working her legs suddenly became weak. She was two months pregnant at that time. The weakness became more marked, and she began to stagger when walking. The hands and arms began to shake, and her eyes kept moving. Although her condition grew progressively worse she did not remain in bed. She felt dizzy when walking. She had no headaches, no pain, no digestive symptoms, but she had some slight bladder disturbance.

The family history was negative as far as could be obtained.

She had two children, the youngest six months old; no miscarriages.

Present condition. The patient is a well nourished young woman. Her eyes are continually moving. She has lateral nystagmus. The optic discs are pale. The pupils react. There is no paralysis of ocular muscles, no facial paralysis. There is marked intention tremor in the arms, and the head shakes on attempting any movement of the arms or hands. The arms are slightly spastic, the legs decidedly so. There is no apparent involvement of the sensory nervous system.

Reflexes. Arms, brisk, epigastric and abdominal absent, knee and ankle jerks very brisk, extensor plantar reflex both sides.

The patient is unable to walk without assistance. Her speech is distinctly scanning.

A diagnosis of disseminated sclerosis was made, but revised after a serological examination of the spinal fluid had disclosed a four plus Wassermann.

From a clinical point of view the diagnosis was justifiable; but if we regard a strongly positive Wassermann reaction of spinal fluid with lymphocytosis as conclusive evidence of syphilis of the brain and cord, then only two conclusions are possible in consideration of this case, either that the classical symptoms of disseminated sclerosis may be exhibited by cases of cerebro-spinal lues, or that the two diseases coexist. The latter is perhaps unlikely, but not impossible.

The following case reported by Nonne illustrates the development of disseminated sclerosis in a patient who had acquired syphilis. A woman aged thirty-nine, married five years, sterile, had lip-chancre ten years before. The primary and secondary stages had been thoroughly treated with mercury. Since then there was no further manifestations of syphilis. The present illness had begun one and a half years ago with paræthesias and motor weakness of the lower extremities. Gradually a spastic paralysis developed. Standing, walking, and movement of legs were impossible. The arms were paretic and contracted. There was hyperæsthesia to touch, temperature, and pain. The bladder was paretic. The cranial nerves were normal. The patient died of decubitus after four years.

The autopsy disclosed an advanced stage of multiple sclerosis of spinal cord. There was no evidence of syphilis in the cord or internal organs.

How unsafe it is to diagnose multiple sclerosis on clinical evidence alone is shewn by the following case:

G. E., a man aged thirty-three, powerfully built, came under my observation in the out-patient department, complaining of feeling nervous. He became very irritable and bad tempered and began to stutter. His memory began to fail and he began to stagger about like a drunken man. He was emotional, with uncontrollable outbursts of laughing and crying.

Present condition. Mentality slow, pupils equal, moderate size, react to light and accommodation. No definite nystagmus. There was some spasticity of arms and legs, and incoördination of

the legs. Reflexes: Upper extremities, very brisk: epigastric and abdominal, active; knee and ankle jerks very brisk. Babinski and Oppenheim present. No Romberg. Spinal fluid, Wassermann, triple plus. He improved rapidly under specific treatment. Five months later the following notes were made: Mentally much better, memory good, feels well and has been at work, no headaches, no stuttering, no incoördination, no ataxia.

These cases are cited in order to emphasize the necessity of excluding syphilis by every available test in all cases that bear any resemblance, however strong, to multiple sclerosis.

Other cases can be found in the literature of the subject shewing the coexistence of the two diseases, multiple sclerosis and syphilis. Since the latter is a comparatively curable and the former an incurable disease, it behooves us to take care that no case of curable meningo-encephalitis escape detection. In reading reports of cases of multiple sclerosis written a few years ago when the diagnosis of cerebro-spinal lues was not as sure as it is at present with our improved methods, one cannot avoid the conclusion that the symptomatology of the two diseases was confused, and that many cases reported as multiple sclerosis were probably lues. Various authors declared that in certain cases of paraplegia it was impossible to differentiate, and that the course of the disease and the therapeutic test were the only means of deciding the question.

In such cases the symptoms common to both these diseases, the spinal type of multiple sclerosis and spinal lues, were paræsthesias and weakness of the lower extremities or paraplegia, exaggerated tendon reflexes, Babinski, weakness of bladder function and spasticity.

Although the morbid anatomy of the two diseases is in the main quite different, the one with sclerotic patches scattered irregularly, demyelinated nerve fibres and shrunken ganglion cells, the other with gummatous infiltration, marked vascular changes and secondary degeneration; yet in both sclerotic changes occur, and in both the net result of the morbid changes may be expressed in one phrase, interference with adequate and continuous nerve supply motor and sensory and inhibition, such interference not being confined to special tracts as in the so-called system disease.

Leaving aside the great question of syphilis, let us now consider the question on what grounds may we safely base a diagnosis of multiple sclerosis, other diseases having been as far as possible excluded.

Mettler holds that cases exhibiting Charcot's classical triad

are comparatively rare, and had found in his experience that the most distinctive features are spastic paraplegia with plus reflexes and Babinski, optic or atrophy, and tremor, the word tremor including intention tremor of hands, nystagmus and scanning or staccato speech. Other associated symptoms are of much less importance; one cardinal sign is not enough to warrant a diagnosis, and that diagnosis should not be based upon mental changes, fugitive pains, slight paræsthesias, other sensory disturbances, transient cranial nerve palsies, apoplectic and epileptiform seizures, bladder and rectal irregularities, pupillary inequalities and bulbar manifestations, since all these symptoms may be found in other maladies.

Collins and Baehr analyze the clinical histories of ninety-one cases and offer the following conclusions:

That the fully developed Charcot type of the disease is but rarely seen; that while there can be no rigid groupings of types of the disease, three general groups can be assumed, a spasticparetic, an ataxic and a hemiplegic group. The best single aid in the differentiation of the disease is the condition of the cerebro-spinal fluid. The absence of the abdominal reflexes, upper and lower, is an important diagnostic sign.

To cite all the symptoms grouped under the heading of multiple sclerosis and the various nervous conditions under which individual symptoms may be found, would be almost an endless task. A few of the more important ones, however, might be mentioned.

Nystagmus occurs in cerebellar and labyrinthine disease, transient cranial nerve palsies, epileptiform seizures and spastic paraplegia in cerebro-spinal lues, paræsthesias in syphilis and hysteria, tremor though perhaps not intention tremor, in alcoholic or lead poisoning, paralysis agitans and functional nervous conditions, affections of speech in dementia paralytica and bulbar conditions, mental changes in various psychoses, bladder weakness in various spinal cord diseases, and so on.

It must be insisted upon, therefore, that all other nervous and constitutional diseases must be excluded by the absence of the symptoms peculiar to those diseases before making a diagnosis of multiple sclerosis.

Perhaps our greatest difficulty lies in that large group of cases in which a few indefinite symptoms are found which cannot be attributed to multiple sclerosis exclusively, but in which we have excluded other diseases. In these cases it is often impossible to make a positive diagnosis of multiple sclerosis, however probable

such a diagnosis may appear to be, and only the course of time, perhaps years, will decide.

The following case, reported by Goodhart, is a good illustration of this point:

A girl, aged twenty-four, had sensory paresis of the hands and flacid motor paralysis of the lower extremities. This disappeared after six months. After an intermission of seven years the classical symptoms of multiple sclerosis appeared.

An acute onset may be misleading. Case reported by Spiller:

A man, aged twenty-five, after exposure to cold and wet and severe labour felt stiff in the legs next morning. He felt pains in his thighs and could hardly walk. This condition lasted a month, after which he had sharp pains in his right leg with marked rigidity.

There was little change for several months. Examination then was as follows: Mentality normal, speech scanning and slow, slight tremor of the tongue, epigastric reflex normal, abdominal and cremasteric absent, patellar reflex plus, ankle clonus and Babinski present, sensation in feet delayed, gait markedly ataxic, some ataxia of upper limbs, intention tremor of the right arm, and nystagmus. At the necropsy typical disseminated sclerosis was found. During the first month of this man's illness a diagnosis of multiple sclerosis would have only been a guess.

In cases of indefinite pains, stiffness and weakness of the legs, especially when persistent, the patient must not be put off with a diagnosis of muscular rheumatism, nor should one be too much inclined to attribute paræsthesias or mental changes or tremor or paralysis of a limb to hysteria. Every possible means of examination should be employed. The blood and urine should be examined, the optic discs examined with the ophthalmoscope, the nervous system, motor, sensory, reflex and mental, should be most carefully examined, and finally a complete history of the patient's past and present illnesses obtained.

The following conclusions are offered:

1. That indefinite and fleeting symptoms should not be lightly passed over, but given due consideration.
2. That the history of every case is of the utmost importance.
3. That all other diseases must be carefully excluded.
4. That in every case presenting symptoms of multiple sclerosis, no matter how marked, the spinal fluid should be obtained and examined.

TUBERCULIN, ITS NATURE AND ACTION

By Robert C. Paterson, M.D.

Saranac Lake, N.Y.

ALTHOUGH it is now many years since Koch[1] announced that he had discovered a new cure for tuberculosis in what he named tuberculin, there is still a great deal of confusion as to what this substance really is and as to what it does. Tuberculin is chiefly a protein derived from the bodies of tubercle bacilli, which is either in solution or in suspension as an emulsion. While commonly spoken of as a serum or lymph, it is neither of these and is absolutely different from the antitoxic sera, as exemplified by the well-known diphtheria and tetanus antitoxins. Tuberculin does not contain living tubercle bacilli and is therefore incapable of itself of causing tuberculosis. Since Koch's tuberculin was first announced numerous modifications have been tried and named until probably forty or fifty varieties have been made in an attempt to obtain some product which would have all the therapeutic activity of the original preparation without any of its disagreeable or dangerous properties. Of all these modifications there are only four or five which are now generally used. These are Koch's Original or Old Tuberculin, called O.T., Denys' Bouillon filtrée or B.F., Koch's New Tuberculin or T.R., and the Bacillus Emulsion or B.E. The first two are solutions while the last two are emulsions of dried bacilli.

Preparation of Tuberculins. O.T. or Old Tuberculin is made by boiling a broth culture of tubercle bacilli for one hour, filtering this through a Berkefeld filter, and then heating the filtrate slowly until it has evaporated to one tenth of its original volume. Denys' B.F. is simpler to prepare and is merely the filtrate obtained by filtering the bouillon on which tubercle bacilli have grown for from six to eight weeks through a Berkefeld filter, the filtrate being tested culturally and by inoculation to be sure of its sterility before being used. The Bacillus Emulsion is a suspension of the dried bodies of tubercle bacilli, which have been ground to a powder, in

Read before the section of medicine of the Canadian Medical Association, June 13th, 1917.

normal salt solution with 50 per cent. glycerine. This is so standardized that 1 c.c. of the finished product equals 0·005 grm. of the dried bacilli. T.R. is similar to the emulsion except that the bacilli are first shaken up with distilled water and then allowed to sediment, the supernatant fluid being removed. This fluid is called T.O. or "Tuberculin Oberstand." The sediment of bacilli is then emulsified with normal saline solution and 20 per cent. glycerine and standardized, so that 1 c.c. equals 0·01 grm. of the residue of dried bacilli. These various tuberculins are all very similar in their action and the choice of which one to use is largely a matter of personal preference.

What is the active principle of these different preparations? This is a difficult question to answer, but it is probable that the active agent of all of them is the dissolved protein, derived from the bacillary bodies. It cannot be a toxin, secreted or excreted by the bacilli during their growth, for the existence of any such toxin has never been proved, and all experimental evidence is against this. In the soluble tuberculins, as O.T. and B.F., the protein is probably derived from the breaking down of a certain number of bacilli and the solution of their body proteins in the medium, while in the emulsions the finely ground bacillary bodies are present in suspension. Tuberculin is not a true or primary toxin or poison. A toxin or poison, properly understood, is a substance, which when introduced into a normal animal in a certain amount, usually minute, is capable of causing certain definite symptoms harmful to the organism and, if in sufficient amounts, death results from the direct action of the substance. As examples of such toxins, ricin and abrin from the vegetable kingdom, the snake venoms from the animal kingdom, and the toxins of the diphtheria and tetanus bacilli might be mentioned. Unlike these toxins, tuberculin is perfectly harmless to a normal animal, even when given in enormous doses. Krause, in the Saranac Laboratory, injected 25 c.c. of a filtered watery extract of tubercle bacilli intravenously into a guinea pig of ordinary size, the only effects being a serous diarrhœa for a few days, the result of the greatly increased amount of fluid in the animal's body. Hamburger[2] emphasized the harmlessness of tuberculin to non-tuberculous persons, stating that old tuberculin had absolutely no recognizable poisonous action on the "virgin" human organism. He gave forty-three children of from 0 to fourteen years of age, all of whom had shown a negative skin test, 10, 50 and 100 mgrm. of old tuberculin subcutaneously without any general symptoms resulting. One girl of six years was given 500 mgrm.

without the slightest general effect. In contradistinction to this inertness in the non-tuberculous, the results of an inoculation of tuberculin, even in minute quantities, are totally different if given to an animal, human or experimental, which harbours tubercles in its body. The animal reacts to the inoculation violently and characteristically, and if the dose is sufficiently large, death results in a few hours. It was an observation by Koch that a guinea pig, already tuberculous, reacted to a subcutaneous inoculation of tubercle bacilli differently from a normal animal, that led to his investigations which resulted in the discovery of tuberculin. This altered reaction to reinfection in tuberculous animals has since been more fully investigated, but its importance to the study of tuberculosis has only been recognized in the last few years. As a result of these studies in reinfection, the broad statement can be made that if an animal has anatomic tubercle anywhere in its body, all its body tissues are altered in some way so that the response to a fresh infection with tubercle bacilli differs from that of a normal animal. In like manner, the body tissues of a tuberculous animal show an altered reaction to tuberculin and we now know that the presence of anatomic tubercle is necessary for the development of tuberculin hypersensitiveness. Supplemental confirmation of this is given by the fact that attempts to produce this hypersensitiveness by inoculations with soluble tuberculins or filtered extracts of the bacillus have been uniformly unsuccessful, although from time to time observers have claimed to have succeeded in attempts of this nature. It has also been impossible to transfer this tuberculin hypersensitiveness to normal animals by inoculations of the serum of patients or other animals which possess this property. Baldwin[3] has shown further that the removal of a localized tuberculous focus by surgical means results in the speedy loss of sensitiveness to tuberculin in experimental animals. It therefore seems certain that the basis of the tuberculin reaction is to be found in the tubercle itself, which in some way, as yet unexplained, causes an alteration in all the body tissues so that they react differently from normal tissues to the proteins derived from the tubercle bacillus or to the tubercle bacillus itself. This altered condition or "allergy" manifests itself as an acute inflammatory change in the tissues into which tuberculin is introduced. I have recently been able to produce in tuberculous guinea pigs, by inoculating the pleural cavity with a filtered watery extract of tubercle bacilli, a slight but definite acute pleuritis with an exudate of fibrin and a small amount of sero-purulent effusion, containing chiefly poly-

morphonuclear leucocytes. The same effect, only more marked, is produced by inoculating the pleural cavity of tuberculous animals with old tuberculin or with emulsion of dried and pulverized tubercle baccilli. In these experiments the acute inflammation of the pleura was most marked and quite unmistakeable.

What effect has the tuberculin on the tubercle itself when it reaches the focus by the blood or by the lymph? Here again we have an inflammatory change which can be readily seen in superficial lesions, as lupus patches or tubercles in the larynx as well as in and around tubercles in experimental animals, which have been killed during a general tuberculin reaction. This inflammatory condition is accompanied by congestion around the tubercle, by dilatation of the vessels and consequently by an increased give and take between tubercle and blood stream. This idea is not new and was recognized shortly after Koch announced his discovery of tuberculin. Kromeyer[4] in 1890 examined reacting tubercles and found inflammatory changes in the neighbourhood. Krause's[5] recent experimental work on the general tuberculin reaction emphasizes this view. With increase in the circulation around the tubercle there passes into the blood stream from the tubercle, something, the nature of which is not definitely known, which causes the symptoms which we recognize as the general reaction and which, if in great enough amounts, will cause death.

From what has been said, it is evident that tuberculin can produce three different effects. (1) Local, at the point of inoculation, an inflammation due to the altered tissue reaction. (2) Focal, an inflammation around the tubercle. (3) General or systemic, the result of absorption from the focus, this absorption being facilitated by the focal inflammation.

With these points in mind we can now consider the clinical application of the phenomena of the tuberculin reaction. Tuberculin is used for one or other of two purposes, first, as an aid in diagnosis, and second, as a therapeutic agent. As its diagnostic value is now generally recognized, little need be said of its use for this purpose. It may be applied locally by scarification of the skin as in the von Pirquet test, by inunction as in the Moro or percutaneous method or by injection into the epidermis, the intradermic procedure of Moussu and Mantoux. These tests are quite harmless if ordinary precautions are taken. Another local test is the installation of a drop of diluted or purified tuberculin into the conjunctiva. This has no advantages over the other local tests and has the decided disadvantage that occasionally

ulceration of the cornea with resulting opacities has followed severe reactions. Such local reactions depend on the sensitization of the tissues by the presence of tubercle in the body and the inflammatory results of the application of tuberculin to such hypersensitive tissue. The subcutaneous method which was the first one to be used depends on the general symptoms produced by absorption of substances from the inflamed tubercle, this inflammation being caused by the tuberculin which reaches the focus by the blood or lymph. This method is not without danger and should only be employed with a full understanding of its mode of action and of the possibilities of doing harm by uncontrollable inflammation of the focus of disease. It is important to remember, but unfortunately frequently overlooked, that the various tuberculin reactions do not differentiate anatomic tubercle, which is perfectly compatible with good health from an active clinical tuberculosis. Autopsy studies, as those of Naegeli[6] and Burkhardt[7], have shown that the great majority of persons above fourteen years of age have somewhere in their bodies a focus or foci of tubercle formation. These autopsy figures are corroborated by the various tuberculin reactions, which show that the majority of adults are hypersensitive to tuberculin. If this fact is remembered, we will be in a better position to appreciate the value of a tuberculin reaction when used for diagnosis. A positive reaction to tuberculin, while absolutely specific in diagnosing the presence of anatomic tubercle, does not mean of necessity that there exists a diseased condition caused by active tuberculosis. Many persons have been condemned to a diagnosis of tuberculosis, merely because they have shown a positive reaction to tuberculin, whereas the cause of the reaction was a latent or healed tubercle which may have had no relation whatever to the symptoms for which they have sought advice.

Ideas as to the therapeutic value of tuberculin have undergone many changes in the past twenty-five years. When its discovery was first announced it was hailed as the long looked-for cure for all forms of tuberculosis, but when reports began to be published of the many unpleasant and even fatal results following its use the remedy fell largely into disuse. A few, however, saw that it was a potent remedy and that it could be of benefit to the tuberculous patient if only the dangerous results could be eliminated. Numerous purified tuberculins were tried in an attempt to discover some modification having all the benefits without the disadvantages of the original substance, but it was found that when the reactive properties were removed the beneficial results were also done away

with. With the knowledge, obtained from clinical observation and animal experimentation, that the doses first recommended were much too large and that dangerous reactions could be reduced to a minimum by using smaller doses, the pendulum of opinion swung back to the side of tuberculin and for several years almost every physician treating tuberculosis used one or other form of tuberculin. After some years of this period of general but cautious use of tuberculin, the question was raised as to whether the results obtained in treated cases were any better than those obtained in persons who had not received this form of treatment. Papers were published and statistics compiled to prove its advantages or its worthlessness, but the practical result of the discussion was that the wide spread use of tuberculin had been generally abandoned except by a few enthusiasts. This is the position at the present time and the question of its efficacy is still undecided in the minds of the majority of medical men. What is the reason for all this confusion? Surely after twenty-five years of use we should be in a position to know whether any given remedy is of value or not and whether our patients should be advised to take it or leave it alone. The answer to this question seems to me to lie in the very general misunderstanding of even the most rudimentary facts about tuberculin. It has been given in the majority of cases without a clear idea of what it is or what it will do to the patient. We have used it without being sure of what results we hope to obtain except in the very general way that we want to arrest the disease and if we have understood the end results desired, we have not thought out how tuberculin is to do what is expected of it. In a loose way there have been statements made about the suppuration and necrosis of tubercles, about antitoxic and bacteriolytic action, about enzymes and anaphylaxis and hypersensitiveness until we have been lost in a maze of words which have confused rather than clarified the discussion. This complicated subject will be much simplified if we confine ourselves to what we know regarding tuberculin and its action. It is well established that tuberculin causes an inflammatory reaction in and around the tubercle; by this reaction the tubercle is opened up more freely to the blood and lymph and that this inflammation favours fibrosis and the consequent walling-in of the tubercle which is what we recognize as healing. Now if we can so graduate our dosage as to react the sluggish tubercle without over reacting it, we will do good. If, however, the dose is so small that it does not react the tubercle the treatment will have no beneficial effects, while if the dose is so great that the reaction is excessive

and uncontrollable we are doing harm. This is apparently a simple proposition and would be so were we dealing with a single tubercle or a group of tubercles that we could have directly under observation, but the problem is complicated by the fact that in clinical tuberculosis we are dealing with a diseased state in which there are tubercles of varying ages and in varying stages of development and of different histological structure, some cellular, some caseous and necrotic and some well enveloped with fibrous tissue. It can be readily seen that an amount of tuberculin which will react a recent cellular tubercle will have no effect on an older fibrous one, while an amount sufficient to cause an inflammation in these older firmer foci will over-react the more cellular ones. Thus no given amount of tuberculin should be expected to benefit all of a person's diseased tissue. Again, our means of estimating the results of our dosage are indirect and inaccurate, depending largely on the subjective symptoms of the patients, which are notoriously inexact and misleading. Add this to the difficulty of correctly estimating the best dosage to give, which must be large enough to have an effect, but not so large as to do damage, while the disease is one with a constantly changing pathological and clinical picture, no case steadily improving and none steadily becoming worse, and the complications of the subject of tuberculin therapy become apparent. While it is foolish to maintain that in tuberculin we have a "cure all" for tuberculosis, it is equally foolish to say that it has no therapeutic activity, as some men do, and the middle course is the only safe and logical one to take, namely, that tuberculin is an agent which definitely affects the individual tubercle and so influences the course of the disease, favourably if properly administered to suitable cases, and harmfully if incautiously given. To obtain a favourable result it must be administered with an intelligent understanding of its action and of the results we hope to obtain.

Summary

The active principle of tuberculin is the protein derived from the bodies of the tubercle bacilli. This is not toxic to normal animals but produces definite reactions in tuberculous animals. The basis of the tuberculin reaction is the tubercle itself. Tuberculin diagnoses specifically the existence of tubercle but does not differentiate tubercle, causing no symptoms, from active clinical tuberculosis. The general tuberculin reaction is produced by absorption from the tubercle, while the local reactions are caused by an allergic condition of the tissues. The benefits of tuberculin treatment de-

pend on the slight focal inflammatory reactions produced by carefully regulated dosage.

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Dr. Wayne Babcock, principal of the Samaritan Hospital, Philadelphia, has just completed a marvellous piece of surgical work. In a case of injury to the head where some inches of the skull bone had been completely shattered, Dr. Babcock removed the damaged bone. After trimming the edges of the fracture, he fitted into place a bone patch made from a shoulder blade of mutton which had been previously stewed for some days. By a series of boilings he extracts the animal matter, then cuts the bone to shape and perforates it with holes about half an inch apart. The sterilized bone is brought into contact with the edges of the living bone and it is fastened in its place by a few stitches of catgut. The live bone now sends new blood vessels into the porous dead bone and thus it is revitalized. Hitherto the operation has been most successful in placing damaged bone at the bridge of the nose.

THE CUTANEOUS MANIFESTATIONS OF SYPHILIS

By A. V. Greaves, M.B. (Tor.)

Captain, C.A.M.C.

THE recognition of the cutaneous manifestations of syphilis, to be in any degree complete, must include a knowledge of the histology of the normal skin, a knowledge of the pathology of syphilis as related to the skin, and a fairly wide knowledge of cutaneous diseases other than caused by the treponema pallidum. To attempt such a comprehensive survey of dermatology is beyond the scope of a paper, be its dimensions never so great; and reference will be made only to such points in the histology and pathology of the skin as will render understandable a few of the commoner cutaneous lesions of syphilis, and a few hints on their recognition and differential diagnosis.

The skin is composed of three layers, from without inwards, viz; the epidermis, the corium, and the tela subcutanea; the epidermis constitutes the horny or true protective layer, and is non-vascular; the corium, or true skin, contains the blood and lymph vessels, nerves, sebaceous and sudoriferous glands and hair bulbs, all enmeshed in a fibrous framework, formed by connective tissue fibres, elastic fibres and a few unstriped muscle fibres; the third layer, the tela subcutanea, is briefly the connecting link between the corium and the underlying structures.

It will easily be seen that, anatomically speaking, the corium is the important layer of the skin.

In considering the pathology of the skin, the fact must never be lost sight of that inflammatory change here follows a precisely similar course to inflammatory change in any other structure; any apparent difference being a purely artificial or accidental one, due to the environmental influence of the particular anatomical structure involved.

When the classical picture of inflammation is borne clearly in mind and considered in relation to the special structural arrange-

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Read at a meeting of the Clinical Society of the Canadian Special Hospital, Etchinghill, Kent.

ment met within the skin, lesions become readily understandable which would otherwise be obscure.

A few remarks on the pathology of some of the lesions of the skin may perhaps be not out of place here.

A *macule* is a circumscribed, non-elevated, change in the normal colour of the skin; or, simpler yet, a *patch of discolouration.*

A macule may be caused in several ways; (1) by a deposit of hæmoglobin in the skin; (2) by simple dilatation of the vessels supplying the skin causing a hyperæmia; (3) by alterations in the normal pigmentation of the skin, either by way of an increase or a decrease of pigment.

A *papule* is an apparently solid, circumscribed, elevation of the skin; papules are arbitrarily limited to the size of a pea, simply for purposes of classification. The formation of a papule is simple, and may be reasoned out without difficulty, when one remembers that there is always *tumour* or swelling as a result of inflammation, if the lesion is inflammatory; if it is not, then consideration of the different elements forming the skin will suggest the structure which may be affected by the increase in size.

A *vesicle* is a circumscribed elevation of the skin containing serous fluid. Vesicles may be of two kinds, viz: parenchymatous, or interstitial; the former are caused by the distension of the individual Malphighian cells of the skin with serum, thus forming a multilocular vesicle; the latter are caused by a collection of fluid *between* the Malphighian cells; this gives rise to a unilocular vesicle.

Arriving at the particular cutaneous manifestations of syphilis, the following quotation from Sir Malcolm Morris is interesting. He says: "No disease is more likely to perplex the inexperienced on account of the protean character of the lesions which it causes and the extraordinary closeness with which it often imitates those produced by other affections." This remark is nothing but a statement of a fact, which every syphilologist fully realizes; at the same time it refers, I think, to the skin lesions of syphilis divorced from other manifestations of the disease, and perhaps for this reason conveys a somewhat different idea to what was intended. A skin lesion should never be considered in the light of a skin lesion only; it should be considered as the symptom of a constitutional condition, and as such, other symptoms should be sought. The diagnosis of an obscure skin lesion is often cleared up in this manner and of no lesions is this more true than those whose origin is luetic.

The clue to many a doubtful case of syphilitic rash may be found by examination of the mouth, a glance between the folds of the

nates, palpation of the inguinal, cervical, and epitrochlear glands, etc. The history of the patient too, will sometimes turn a doubt into a certainty. A case illustrating this point was admitted into our syphilis wards a few days ago. The patient was a man aged forty-six; married; he had a well marked rash, presenting many characters pointing to a luetic origin but still somewhat atypical; other signs of syphilis were absent; his history, however, furnished the necessary clues; he had not married till he was thirty-two years of age, thus leaving his early manhood open to suspicion of considerable irregular intercourse, and his wife had had three miscarriages and had lost a child in early infancy. A diagnosis of syphilis was made and was later supported by a three plus Wassermann.

Turning our attention to the characters of syphilitic rashes, I will, first, refer to them in a general way; later discussing their particular features from a diagnosis standpoint.

The special characters of the secondary lesions of syphilis are:

1. Polymorphism; that is, the presence at the same time of lesions of different types. For instance, macules, papules, and scaly spots may all be in evidence together. This is exactly what one would expect, remembering that the cause of the eruption is a *generalized disease*. At the same time the size of the individual lesions does not vary much.

2. A wide dissemination. The lesions are abundant in quantity and occupy a wide area of skin. They are also symmetrical. Morris considers this the most distinctive characteristic of the eruption as a whole.

3. A peculiar colour. While this peculiarity of colouring is not in itself confined to syphilitic lesions, taken in conjunction with other characteristics it helps to form a complete picture.

4. A uniformly round shape. The individual lesions are either round themselves, or tend to form circular figures.

5. Absence of irritability.

Bearing these general characteristics in mind, we will now examine the different types of lesion in detail.

The earliest to appear is the *macular syphilide;* often referred to as the roseola. This usually makes its appearance about a month after the initial sore. It is a widely spread rash and covers practically the whole skin area, excepting the face, where it is exceedingly uncommon to find it. The individual lesions are macules, round or oval, when their borders can be distinctly defined; but it is far more commonly seen as a very ill defined rash, the borders of the

individual lesions fading into each other, giving the skin an appearance that may best be described as a "mottling". This is especially the case in the earlier stages and later when the rash is beginning to fade, and it is at this time that it may be missed entirely, especially if the skin be examined piecemeal, with the eye at close quarters; the patient should be fully stripped and the general appearance of the skin noted from a little distance; the mottled effect is plainly apparent in this manner. In artificial light, too, the rash is quite difficult to make out and daylight should be used when possible. The colour is at first a faint rose, but this becomes stronger and gradually assumes a pinker hue. There is no scaling and no itching. Coincident with this early rash there is almost always a granular condition of the pharynx; this latter condition may be considered as the equivalent to the skin eruption as affecting the mucous membrane of the throat. The rash usually begins to fade in two or three weeks, but may last longer; morever, it often recurs within the first year and this becomes a point of importance in diagnosis, when elicited from a patient in questioning. After persisting for a variable time, the macules which are at first due to hyperæmia of the papillæ of the skin, fail to disappear entirely on pressure. This is due partly to the presence of some infiltration, and partly to some pigmentation of inflammatory origin. Morris remarks on the action of cold in intensifying these lesions; this could be accounted for, in part at least, by the natural blanching of the normal skin between, showing up more distinctly the more permanent pigmentation.

The macular rash is followed, or indeed often has superimposed upon it, the papular syphilide; with the appearance of this, there is demonstrated the characteristic, referred to previously, of polymorphism; from this stage onwards we may expect to find on the skin almost any lesion of syphilis, associated with any other lesion in a given case.

Papular syphilides may assume several different forms, each possessing some special characteristic, while conforming to the general type of syphilitic rash. The commonest type by far is known as the *lenticular syphilide;* this is a papule about one third of an inch in diameter with a shining rounded top, often possessing a scaly ring at the edge; the distribution is very widespread, almost always including the face; it is not so profuse perhaps on the lower limbs as on the upper part of the body; there is not much tendency to any special grouping; in colour, it varies from a fairly dull red to a ham tint, the latter being more usual; on palpation it feels infil-

trated, but is not shotty, as it is sometimes described; the shotty sensation imparted to the finger by variola in its early stages is quite different, and is correctly described by that adjective. Along with this type there are often many papules present, rather flattened than rounded; this flat eruption may be scaly; it is then termed a *papulo-squamous* syphilide. A papular eruption is sometimes seen affecting the forehead just at the hair margin; this is known as the *corona veneris*, and must be carefully differentiated from the corona seborrhœica, which is always associated with a seborrhœic condition of the scalp and frequently with seborrhœic lesions elsewhere; itching is a prominent feature in seborrhœa, whereas it is usually absent in syphillis. Another type of papular eruption that is sometimes seen is the *corymbose syphilide;* the most frequent site of election of this type is the back, especially along a transverse line drawn through the centre of both scapulæ (McDonagh). The structure of the corymbose syphilide is best made out with the aid of a small lens, when it will be seen to consist of a central papule surrounded by tiny miliary papules, about the size of a pin's head, involving the hair follicles. In this way there is formed a grouped lesion with a central large papule ringed about with tiny ones; this group forms the unit of the rash. The tiny papules referred to as arising from the hair follicles, are occasionally present unaccompanied by the large central lesion, forming the *follicular syphilide;* this is best seen in the same situation as the corymbose syphilide, viz.: between the scapulæ. It is supposed that this type of rash is indicative of a severe infection.

A characteristic of the papular syphilides is that there is marked staining after the retrogression of the lesions, this may last for years, and its presence is of use in diagnosis.

Another eruption, not infrequently seen, is the squamous syphilide. This is really a papulo-squamous lesion, as the base is formed by a large flat infiltration; but the most distinctive and characteristic feature is the covering of scales, hence the name squamous. The favoured sites are the face, neck, back and in the bends of the elbows and behind the knees. The site of election is important in differential diagnosis as the likeness to psoriasis may be striking; there is this important difference, however, that a squamous syphilide is exceedingly rare on the elbows and knees, while these points are the favoured locations for psoriasis lesions. In psoriasis, too, when the scale is removed from a patch, there is a vascular area exposed, with a number of tiny bleeding points, whereas in the syphilide, the base is dull red without bleeding points.

A papular syphilide may in special situations undergo a further development by overgrowth of the papillæ; in this manner is formed the so-called *mucous patches* in the mouth and the *condylomata*, found in moist areas, such as between the folds of the nates and the flexures, etc. Papular syphilides may degenerate and form *pustular syphilides;* the diagnosis of this lesion may offer great difficulty at times and the following points must be borne in mind. The lesion in syphilis is never primarily a vesicle; since, as the organism develops in the corium and degeneration here always leads to pustular formation (McDonagh) no vesicular lesions will be found. Also in the one case the roof of the lesion is thin and easily collapsed, being covered only by epithelium, while in the other it is firm and strong, as the lesion originates in the deeper layers. The pustular syphilide is always superimposed on a papule, while the vesicle of varicella is surrounded by normal skin. The lesions thus shortly described are the commoner of those associated with early generalized syphilis.

I will now refer very briefly to the cutaneous lesions of the later stage of the disease. Tertiary eruptions are usually localized, with considerable infiltration of the skin and subcutaneous tissues; they are entirely lacking in symmetry of distribution, tend to break down and form ulcers, and usually leave well marked scars; they have little tendency to spontaneous cure. There are two common late lesions that must be recognized; the *nodular syphilide* and the *gummatous syphilide.*

The nodular syphilide consists of one or more nodules of the familiar ham colour; they tend to assume a circular arrangement; they may be covered with scales; commonly, they break down and form ulcers of a serpiginous type; they are oftenest seen on the face especially the nose. They must be distinguished carefully from lupus vulgaris; the latter disease is comparatively slow in onset, while the nodular syphilide may be developed in a few weeks. The gummatous syphilide is a lesion caused by infiltration of the skin with connective tissue cells, as a reaction to the luetic infection.

The greatest reaction takes place about the blood vessels and in time the blood vessels may be shut off by the cellular infiltration; this will cause necrosis of the tissues above, served by these vessels and result in the breaking down of the gumma, an ulcer being formed. This ulcer is characterized by a sharply punched out edge, steep sides, and a wash leather base; the lesion is discrete, has no tendency to spread or coalesce with adjoining lesions, and the surrounding skin shows no evidence of inflammatory reaction.

McDonagh explains the pathology of the formation of this lesion by assuming the circulation of the skin to be analogous to that of the liver, whereby definite areas, about the size of a shilling, are served by a central artery, with radiating branches, the venous return being accomplished by circumferential veins; each area of skin thus nourished becomes practically a unit. Thus, if this area becomes the site of cellular infiltration, a gumma will be formed, limited in extent and definite in outline; should the central blood vessel become occluded by pressure of the surrounding connective tissue, an ulcer will result, also limited in extent, sharply outlined, and having no tendency to spread to the adjacent tissues, or coalesce with another gumma, however near. Gummata may occur anywhere. The scar left by a gumma is usually covered by a very thin tissue-paper like pellicle, which wrinkles when picked up between the fingers, and is of straw colour.

The above are the common skin lesions of syphilis; no mention has been made of the lesions affecting the mucous membranes of the mouth, as this subject will be taken up in a later paper by another member of the staff of this unit.

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THE TEACHING OF HYGIENE

By A. H. Mackay, LL.D.

Superintendent of Education for Nova Scotia

IN the elementary (or common school) grades, hygiene should be taught continuously from grade I to grade VIII, adapted by the teacher to the age of the pupils, laying emphasis, with attention-fixing illustrations, on the importance of health for the future enjoyment as well as usefulness of life. As sex-hygiene cannot be expected to be dealt with physiologically with good effect by even a small minority of our best elementary teachers, the Christian moral viewpoint should be stressed as the consensus of the experience of the best men and women of all ages and of all happy parts of the world. The text-books prescribed for the elementary grades form a very good basis of hygiene doctrine which should be presented to the pupils with demonstrations and illustrations adapted to affect their emotions, impress their memories, and develop resolutions. With this instruction, appropriate physical exercises, and medical inspection of the schools and the pupils, should be regularly carried on; and card records of the physical development of each pupil should be filled in at least once a year, and accompany the pupil from grade to grade.

In the high school grades the same general plan should be carried on in all detail. But in addition, it is very desirable that a course of elementary anatomy, physiology and hygiene should be given for at least one year, utilizing when possible, any aids from the biological course—botany and zoology. In many high schools with tactful teachers, depending somewhat on local conditions, scientific truths could be emphasized at this stage, which could not be effectively attempted in the common school grades.

As good health is the most fundamental basis of personal efficiency, hygiene is the first thing which should engage our attention in the public school programme. Then as a second should come the vocational subjects, to prepare the pupils for earning a living. Then thirdly, the avocational subjects, to enable them to use their

Read at the forty-eighth annual meeting of the Canadian Medical Association, Montreal, June 13th, 1917.

leisure properly, with enjoyment to themselves and benefit to society in general.

This threefold grouping does not exclude the full culture of the soul; but for this we must have under present conditions the coöperation of specialists in our various religions—in the church if not in the school.

To carry out this part of the school programme effectively, it is necessary to have the teachers well trained in the biology of man, at least in the high school for teachers of the more elementary schools, and in the universities or medical colleges for the more advanced schools. This scientific knowledge should be revised in the teacher's training schools while methods of presenting the instruction to pupils so as to interest, impress and control them, is being developed.

In the great majority of schools, the teacher must be able not only to influence the pupils, but the school boards, and the parents. To do this the teacher must be well posted not only in the subject of hygiene, but in the correlative knowledge necessary to show the advantages of such instruction; and also to outline the regulations to be enforced.

The teacher should be acquainted with the statistics of the medical inspection of schools, to be able to prove what such an inspection would accomplish beyond leaving the care of the young entirely to the tender but unenlightened mercies of the majority of parents, and to their physicians who are generally only called in when some member of the family is supposed to be seriously ill.

Children in nearly every family grow up under disabilities which are assumed to be the inevitable and common lot of all, just because they were not examined for defects or malformations which could have been readily eliminated with often enormous advantage to their power, comfort and life-work. In rural schools the importance of inspection is even greater than in the towns and cities where a doctor is near at hand and the expense of medical family visitation, comparatively, is not great.

I would therefore emphasize the importance of good courses on hygiene in high schools and universities for all teachers, as well as in the normal training schools. In universities and medical colleges I would recommend special courses bearing on public sanitation and hygiene. And in addition there should be psychological courses preparing medical men for the classification of school children and others according to mentality. This is absolutely necessary when we have to make provision for the segregation, and education when

possible, of the various classes of feeble-minded—the imbecile, the moron, the retarded, the abnormal. This would involve a training in the application of such tests of mentality as the Binet, the Binet-Simon, and other modifications of such testing systems.

We have in every province of Canada provided for the education of the normal child, the segregation and care of the blind, the deaf, the harmless insane, the dangerous insane, and a class of the incorrigible. But we have not yet in most places begun to provide properly for the segregation and care of the imbecile, of the ordinary feeble-minded, and of those whose lack of self control make them a source of danger to society; or even to provide desirable schools for slow pupils who may develop into very useful members of society.

To authoritatively classify such pupils, specially trained experts will be required; and we must look for them mainly from our medical and higher scientific university courses. In fact our governments can hardly be expected to provide the institutional equipment until authoritative classification experts can be found.

I feel that this is a very feeble contribution to the symposium on a complete system of hygiene teaching—physical hygiene, mental hygiene, social hygiene.

I regret my inability to be present to enjoy the advantage of the other addresses on the subject and the discussions arising from them.

Case Reports

RUPTURED ECTOPIC—BLOOD TRANSFUSION AND PULMONARY EMBOLISM

By R. V. B. Shier, M.D.

Cookstown, Ont.

On October 10th, last, I was summoned to see a woman some miles out in the country. I found her in a serious condition presenting the signs of abdominal hæmorrhage. The history and patient's condition quickly led to a diagnosis of ruptured ectopic pregnancy. Dr. Little and Dr. Lewis, of Barrie, were called in consultation, and while waiting for their arrival the nurse and myself transformed the kitchen into an operating room and gave our patient saline interstitially. We placed her on the table at 1.30 a.m., just six hours after onset of symptoms. She was pulseless, her pupils dilated and altogether not at all encouraging.

The abdomen was quickly opened and found full of blood and clots. The ruptured tube was easily located, its pedicle clamped and tied off. Pituitrin 1 c.c. was now given. The abdomen was made reasonably free of blood and clots and the incision closed, drainage being provided by two rubber tubes passing down to the pelvis. The patient was returned to bed with the foot elevated.

About two hours later, as soon as was possible, I transfused her from her husband. He was a healthy, robust man. About 750 c.c. of blood was used. Sodium citrate method followed. The usual signs of improvement after transfusion followed, and from then on the patient made an uninterrupted recovery. The incision healed by first intention and by the eighth day she had a good appetite, a normal temperature, and a pulse of 96.

Her improvement continued until the morning of the twelfth day, when suddenly, while in conversation with the nurse, she was seized with a fainting spell and gasped for air. Collapse followed immediately, the pulse dropped to 70 and was very weak. I was called and found her cyanotic and suffering from dyspnœa. She had no pain but her pulse was now 140. I suspected pulmonary

Received for publication November 7th, 1917.

embolism and gave stimulants and fresh air in abundance. In a few hours time the cyanosis lessened, but the pulse remained fast and the dyspnœa increased. The respiratory rate reached 58 to 60 at times. The air hunger was extreme. By this time one could notice marked diminished expansion on the left lung, base being practically immobile. Her condition remained much the same for thirty-two hours when death came through gradual cardiac failure.

The case is interesting for the following reasons.

1. The difficulties under which we operated, considering the home surroundings and the patient's condition.

2. The advantage of blood transfusion either before or after operation.

3. The rare opportunity of watching a case of pulmonary embolism, the extreme dyspnœa being the outstanding feature.

The distribution, free of charge, of antitoxin for the treatment of diphtheria helped to bring the death rate down to 6·6 per thousand during the month of March. According to the statement issued by the Ontario provincial board of health this distribution cost $2,227.80. There were twenty-three deaths out of 347 cases. In Windsor, the centre of the epidemic, there were fifty-eight carrier cases and thirty-four clinic cases, as compared to twenty-six carrier and sixteen clinic cases in March, 1916.

Editorial

THE INVALIDED SOLDIERS' COMMISSION AND THE NEW DEPARTMENT OF SOLDIERS REESTABLISHMENT

THE Right Honourable the Prime Minister in a memorandum called the attention of His Excellency the Governor General in Council to the relative powers, responsibilities and duties of the Department of Militia and Defence and the Military Hospitals Commission in the care and treatment of invalided soldiers, stating that the arrangements provided had not proved useful or indeed practicable. It was also represented that a certain point of time should be fixed when the duties of the Department of Militia and Defence ceased and those of the Military Hospitals Commission commenced. Arrangements were then made, with the approval of the Minister of Militia and Defence and the President of the Military Hospitals Commission, whereby all invalided soldiers who required medical treatment should be taken care of in institutions administered and controlled under the direction of the Minister of Militia and Defence with the exception of those who continued to require treatment on account of suffering from tuberculosis, epilepsy, paralysis, or other diseases likely to be of long duration or incurable and requiring institutional treatment or on account of being mentally deficient or insane.

Soldiers who have ceased to require further treatment shall be struck off the strength or discharged and soldiers so struck off the strength or discharged shall thereafter, under certain conditions, be entitled to the facilities for education or permanent treatment or care.

Such soldiers shall pass under the care of the Military

Hospitals Commission which Commission shall hereafter be known as the Invalided Soldiers' Commission.

A new department has been established known as the Department of Soldiers Reëstablishment. presided over by a Minister, the duties of the said Minister extending to and including the following:

(a) The providing of hospitals, convalescent homes and sanatoria, whether permanent or temporary, for the care or treatment of invalid officers, non-commissioned officers, men or other members of the Canadian Expeditionary Force who have been honourably discharged therefrom, and the administration, control and direction of all such hospitals, convalescent homes and sanatoria, whether heretofore established or to be established.

(b) The vocational, educational and other requisite training for civil occupation of all persons who have served in, and who have been honourably discharged from the Canadian Expeditionary Force;

(c) The provision of employment, and all such assistance therein as may be requisite or advisable for the persons aforesaid, and generally for their rehabilitation in civil life and activities;

(d) All matters relating to pensions for the persons aforesaid;

Provided that nothing herein shall interfere with, or affect, the powers or authority of the Board of Pension Commissioners.

Provision shall be made so that the Military Hospitals Commission may continue to carry on educational and vocational training in the military institutions for the care and treatment of officers and soldiers of the Canadian Expeditionary Force before they are struck off the strength or discharged, and facilities shall be furnished by the officers in charge of such institutions for the effective and continuous carrying on of such training by instructors appointed by the Military Hospitals Commission and under its control (such

training to be subject to the direction of the medical officer in charge of the institution), and for the installation and maintenance in such institutions of such apparatus as may be necessary therefor.

The Military Hospitals Commission shall continue to provide such artificial limbs, orthopædic boots and appliances as may be required, and, upon requisition by the medical officer charged with the treatment of any officer or soldier, shall furnish such artificial limbs, orthopædic boots and appliances as may be necessary.

The Military Hospitals Commission shall provide such premises and accommodation as are necessary from time to time adequately to care for officers and soldiers struck off the strength or discharged for whom treatment is desirable or necessary by reason of their suffering from tuberculosis, epilsepy, paralysis, or other diseases likely to be of long duration or incurable, or by reason of their being mentally deficient or insane.

The Military Hospitals Commission shall also provide to the extent, and in the manner from time to time determined by the Governor-in-Council for the medical care and treatment of men formerly officers and soldiers who having been struck off the strength or discharged, as not requiring further treatment, nevertheless subsequently require such treatment by reason of disabilities due to or aggravated by service.

The following Institutions pass under the direction of the Department of Militia and Defence and the Military Hospitals Commission respectively:

INSTITUTIONS AND PARTS OF INSTITUTIONS TO BE TAKEN OVER GENERALLY BY THE MILITIA DEPARTMENT

1 Hospital Trains

Military District No. 1

	Name of Institution	Beds.
2	Military Convalescent Hospital, London	108

Military District No. 2

3	Spadina Convalescent Hospital	227
4	College Street Convalescent Hospital	126
5	Oakville Convalescent Home, St. Catharines	25
6	Military Orthopædic Hospital	440
7	Victoria Convalescent Hospital, Hamilton	20
8	Dunedin Convalescent Hospital, Hamilton	9
9	Brant House, Convalescent Hospital, Burlington	242
10	National Cash Register Building	600
11	Officers' Convalescent Hospital, Toronto	18

Military District No. 3

12	Queen's Military Convalescent Hospital	380
13	Fleming Convalescent Home, Ottawa	82
14	Ontario Military Convalescent Hospital, Cobourg	152
15	Elmhurst Convalescent Hospital, Kingston	46

Military District No. 4

16	Drummond Convalescent Home, Montreal	171
17	Grey Nun's Convalescent Home	285
18	Khaki League Home	50
19	St. Anne's Military Hospital	

Military District No. 5

20	Savard Park Convalescent Hospital, Quebec	114
21	Discharge Depot (Old Immigration Buildings)	

Military District No. 6

22	Camp Hill Convalescent Hospital	300
23	Pine Hill Convalescent Home	123
24	Military Hospital, Pier 2	475
25	Ross Convalescent, Sydney	31
26	Moxon Convalescent Home, Sydney	79
27	New Military Hospital, Charlottetown	200

Military District No. 7

28	Armouries Military Convalescent Home, St. John	231
29	Military Hospital, Fredericton	
30	Discharge Depot	

Military District No. 10

31	Manitoba Military Convalescent Hospital, (except the Machinery Hall, Horticulture Building, Farm and Farm Buildings.)	534
32	Deer Lodge Convalescent Home	48
33	Keefer Convalescent Home, Port Arthur	22
34	I.O.D.E. Hospital, Winnipeg	60
35	Receiving Depot, Winnipeg	23

Military District No. 11

36	Esquimalt, Convalescent Hospital	110
37	Resthaven Convalescent Home	131
38	Qualicum Convalescent Home	150
39	Fairmount Convalescent Home	140
40	Vancouver General Hospital (1)	300
41	Shaughnessy Convalescent Home	203
42	Vernon Convalescent Hospital	36
43	Columbia Hospital Annex, New Westminster	200

Military District No. 12

44	St. Chad's Military Convalescent Hospital	52
45	Moose Jaw Military Convalescent Hospital (1)	241

Military District No. 13

46	Ogden Military Convalescent Hospital, Calgary	179
47	Edmonton Military Convalescent Hospital (to become an educational institution and transferred back to the M.H.C. upon the completion of the proposed extension to the Strathcona Military Hospital)	180
48	Strathcona Military Hospital	156
49	Calgary Convalescent Hospital	64
50	Wetaskiwin Convalescent Home	50
51	Discharge Depot	

INSTITUTIONS AND PARTS OF INSTITUTIONS TO BE RETAINED BY MILITARY HOSPITALS COMMISSION

Military District No. 1

	Name of Establishment	Beds
1	Byron Sanatorium	90
2	Freeport Sanatorium	32
3	Military Convalescent Hospital, Guelph (1)	726

Military District No. 2

4	Euclid Hall, Toronto, for incurables	31
5	Muskoka Free Sanatorium	61
6	Mountain Sanatorium, Hamilton	144
7	Newmarket Hospital for Insane	150
8	Whitby Convalescent Hospital	648

Military District No. 3

9	Mowat Memorial Sanatorium, Kingston	141

Military District No. 4

10	Laurentian Sanatorium	49
11	Laurentian Inn Sanatorium	67

Military District No. 5

12	Lake Edward Sanatorium	60

Military District No. 6

13	School for Blind, Halifax	
14	Dalton Sanatorium, P. E. I	27
15	Kentville Sanatorium	154

Military District No. 7

16	Riverglade Sanatorium	40

Military District No. 10

17	Ninette Sanatorium	99

18	Machinery Hall, Horticulture Building, Farm and Farm Buildings now part of the Military Convalescent Hospital	

Military District No. 11

19	Balfour Sanatorium	102
20	Tranquille Sanatorium, Kamloops	31

Military District No. 12

21	Earl Grey Sanatorium, Regina	67
22	Qu'Appelle Sanatorium	22
23	New Sanatorium, Prince Albert (1)	44
24	Emmanuel (New M.H.C.), Saskatoon	72
25	Saskatoon Convalescent Hospital	149

Military District No. 13

26	Frank Sanatorium	61
27	Mountain View Sanatorium	25

Any institution which may at any time be under the direction and control of the Military Hospitals Commission, or of the Minister of Militia and Defence may, with the approval of the Governor-in-Council, be transferred to the control and administration of the Minister of Militia and Defence, or of the Military Hospitals Commission as the case may be.

THE most Reverend Cosmo Gordon Lang, Archbishop of York, on his recent visit to Montreal gave a notable address to the Women's Canadian Club on the special problems he foresaw arising in Canada, as well as in England, both in the immediate and far-reaching future. He dwelt on the question of infant welfare and the absolute necessity that exists for conserving child life. In making mention of the nurses furnished by England for the British Expeditionary Force he said they had not only sent fifty-six hospitals to the French army, but had also supplied it with a complete corps of nurses and fifty canteens.

The Primate is a speaker of restrained force, of essential dignity, of unshaken resolution, and supremely solemn convictions. Prior to his Montreal visit he had delivered in the neighbouring Republic seventy-three addresses to audiences numbering approximately eighty thousand people.

His Grace is the eighty-fourth Archbishop of York, and represents, with distinction, an ancient historic line of unbroken succession.

An able address was delivered in the Faculty of Education building, Toronto University, to a large and influential audience on March 22nd, by Dr. Winnifred Cullis, Professor of Physiology in the Royal Free Hospital School of Medicine, London, England. Dr. Cullis told the story of the pioneer woman doctor, Dr. Elizabeth Garrett Anderson, and told it well. After describing her early struggles and the difficulties she encountered in her endeavours to enter the medical profession, she told the tale of the splendid success of the college and hospital which Dr. Anderson founded, the New Hospital for Women, which began life as a dispensary. Last year as many as forty thousand women patients were given treatment in the dispensary of this hospital, and from three to four thousand in-patients cared for. Hundreds apply for treatment who have to be turned away. There is always a waiting list of women to enter the hospital as patients.

Dr. Elizabeth Garrett Anderson, since last Christmas, has passed away and, in England, a plan has been launched to endow fifty beds, each at a cost of £1,000, as a lasting memorial to the pioneer woman doctor's work. Already the women of the dramatic profession, the women artists, the great colleges, Newnham, Girton, Somerville and Lady Margaret, have volunteered to contribute their quota. The women of Australia have volunteered to do the same. Dr. Cullis in appealing to Canadian women said that the

New Hospital is empire-wide in its pioneer work; one woman actually came from the prairies all the way to England because she wanted to be treated iu a woman's hospital. The whole empire of women owe a debt of gratitude to Dr. Garrett Anderson, and even more than the intrinsic value of the money was the spirit of Empire which such things engender.

One of the many fine remarks made by Dr. Cullis is specially worthy of note: "One of the greatest qualifications of women is that they rise enormously to responsibility, and when they fail it is nearly always for lack of opportunity."

A committee of representative women was appointed to take part in establishing the memorial to Dr. Elizabeth Garrett Anderson in the "New Hospital for Women", Euston Road, London, England.

The Montreal Women's Canadian Club has already sent $100 to Dr. Cullis to start the fund.

The thirteenth Annual Report of the Nova Scotia Sanatorium was tabled at the meeting of the House of Assembly. On September 30th, 1916, there were thirty-eight patients at the Sanatorium, and sixty-four were admitted during the year. Of these, twenty-nine remained at the end of the year. The total expenditure was $39,382. The superintendent outlined the extension scheme which had been carried out and, including the tented colony, there were now one hundred and eighty military tuberculosis cases under treatment. The permanent buildings are four in number, hospital, two pavilions, vocational building, and new recreation hall. The vocational building will have appliances for teaching handicraft in leather, brass and wood. Instruction will be given in the management of motor cars, stenography, type writing and general education for men. The new infirmary, now in process of erection, will probably accommodate sixty-two in small groups of three or four on

a porch, with separate rooms for each patient. Here also will be the examining offices, the laboratories, operating room, nose and throat room, tuberculin room and *x*-ray room.

The medical superintendent of the Nova Scotia Sanatorium considers that the results since the year 1910 are such that the institution is an economic success, a good investment for the Province, as its fine group of buildings will eventually be handed over to the Nova Scotia Government for the use of the civil popoulation. The extensions under way will provide accommodation for two hundred more patients during the coming year.

The Rochester Medical Association entertained recently as guest of honour Captain E. Ryan, superintendent of Rockwood Hospital. Captain Ryan delivered a most thoughtful and inspiring address to the meeting. He particularly specialized the wonderful advancement in war surgery, more especially specially in wound treatment, stating that principles and theories held dear in bygone days have passed away. The antiseptic treatment has failed to produce results. Carbolic acid, bichloride, biniodide and the rest of the family are numbered with the slain. They are powerless to resist the terrible avalanche of pus that accompany war wounds. He alluded to the method of treatment of those eminent research workers, Carrol and Dakin, which is quite universally commended. Captain Ryan then took up the orthopædic side of war surgery and the development and advancement of curative workshops. Without presuming to give advice on the war problems confronting us, the speaker stated that he had seen hundreds of cases of shell shock, and he was of opinion that men of nervous temperament, who are most liable to be affected by this malady, should not be sent to the firing line. He considered the greatest possible care should be taken in excluding those exhibiting an unstable, psychic or neurotic temperament, and that men specially

experienced in this class of work should supervise the material for the armies going overseas. The heart, lungs, kidneys, etc., are all examined by men carefully trained in this work, and he had no hesitation in saying that men trained in psychosis or psychoneurosis should pass upon many of those called for enlistment. Experience had taught him that cases of war psychoneurosis should be discharged from the army and be permitted to return to civil life; their economic power is of far more benefit to the nation than their fighting power is to the army.

Captain Ryan is a brilliant and well-known Canadian physician, for many years Professor of Anatomy of Queen's University. He was sent abroad in March, 1917, with the Ontario Military Hospital. For a year he was actively engaged in medical work in England and saw thousands of wounded in the hospitals. Later on he was recalled to Canada and now he is connected with the Toronto M.O.D. unit, which is caring for medical and surgical cases sent back from England and France.

By Order-in-Council No. 432, under date February 21st, the Canadian Government created a department to administer the work in connexion with the reëstablishment in civil life of those who have fought for Canada and the Empire in the present war. The name of the department is the "Department of Soldiers' Civil Reëstablishment", which will be presided over by Sir James Lougheed, who has been appointed Minister of Soldiers' Civil Reëstablishment. The duties and powers of the new minister will cover, (a) The provision of institutions for the care and treatment of invalided officers, non-commissioned officers and men of the Canadian Expeditionary Force who have been honourably discharged, and the administration, control and direction of all such institutions; (b) Vocational and Reëducational training of all such discharged men; (c) The provision of

such employment and assistance as may be requisite or advisable for such men; (d) All matters relating to pensions.

The Military Hospitals Commission with its staff is to be continued under the name of the Invalided Soldiers' Commission.

A NATIONAL committee for mental hygiene in Canada was organized at a meeting which took place in Toronto on February 26th, last, under the presidency of Dr. C. K. Clark. Mr. Clifford Beers, of New York, addressed the meeting, outlining the organization of the National Committee for Mental Hygiene in the United States. The sum of $20,000 was subscribed as a guarantee of the work of the committee during the first three years. Among those present were Sir Robert Falconer, Major and Mrs. J. G. Fitzgerald, Dr. C. J. Hastings, Dr. Helen McMurchy, Drs. Peter Bruce and D. K. Russell, of Ottawa, Dr. O. C. J. Withrow, Dr. Gordon Bates, Dr. Gordon Howland, Dr. Horace L. Britton Dr. E. J. Pratt, and Professor Peter Sandiford, Mrs. Crerar and Mrs. A. M. Huestis. Dr. D. N. Hincks acted as secretary.

A COMMITTEE has been organized under the title of the "Halifax Home and Blind Relief Fund" for the relief of those who suffered in the Halifax explosion and particularly those who where blinded. The chairman of the committee is Sir William Fraser, the director of the Maritime School for the Blind. Mr. Havelock Sansom, the manager of the Tobique Lumber Company of Cambellton, the secretary-treasurer, is engaged in the preparation of lantern slides of Halifax and in collecting information for a series of lectures which it is proposed to give in Canada and the United States. Other members of the committee are Lady Fraser, Mrs. A. E. Smith of St. John, and Mrs. P. M. Fielding, of Windsor, Nova Scotia.

The Association

THE COMBINED MEETING AT HAMILTON
PRELIMINARY PROGRAMME

THE Mayor, the city officials and the public generally, will welcome to our city, the visiting members of the medical profession and their friends in this great Congress Week. They trust their visit will be profitable from a scientific point of view and that their comfort and pleasure will encourage them to return at some future date, to learn something more of our beautiful city.

Nestling in the heart of the garden of Canada, Hamilton can boast of its favourable geographical location and beautiful surroundings. It is known far and wide as the Industrial City by reason of the fact that with a population of approximately 110,000 it operates nearly 500 industries.

Located on the shores of Hamilton Bay, a landlocked harbour at the head of Lake Ontario, it has outgrown its original boundaries to the south, east, and west and now extends well upon the height of land to the south, which the citizens are proud to call a mountain. Easterly it reaches into the richest fruit and produce garden of which Ontario boasts and westerly almost to the outskirts of the neighbouring town of Dundas.

Travel where you will, you will not find a more beautiful panoramic view than one gets from the brow of the Hamilton mountain, which rises to a height of about 300 feet. In the immediate foreground is the bustling city, rich in foliage at this season of the year; to the right is the Niagara fruit belt, to the left the beautiful Dundas valley and in the background the peaceful water of Hamilton Bay backed by the blue waters of Lake Ontario. Far in the distance, on a clear day, can be seen the outline of the big buildings in Toronto, something more than 40 miles away.

With electric railway lines running out in all directions and boat lines connecting with the north shore of the Bay, Toronto, Grimsby, Niagara and other points of interest, it is not surprising that Hamilton is rapidly becoming a tourist and convention city, as it has long been an industrial centre. Large enough to be

interesting it is still small enough to be sociable, and the stranger within its gates is assured of a hearty welcome and a good time.

At the head of the Bay the motorist drives along the crest of a sand bar formation known as Iroquois Beach, a relic of preglacial times. As one looks to the west the banks of a one-time great river are plainly seen and geologists tell us that at some spot not definitely located the waters from the north and south met and mingled. This geological secret has aroused the interest of the scientists of two hemispheres.

Hamilton and the surrounding country abound in spots of historic interest, foremost of which is the Stoney Creek battlefield, accessible by motor or electric car. The Dundurn Ridge is another spot that has found its place in history, while many interesting ruins of the early settlers' days are to be found at and about Ancaster, situated on the mountain brow about six miles distant from the centre of the city, and also to be reached by motor or electric car. Another electric line will take the sightseer to Burlington Beach, a narrow stretch of land that separates the Lake from the Bay and the popular summer resort of the citizens. A drive along the Toronto-Hamilton highway gives one an idea of the beauty of the surrounding country and the general prosperity of the whole district, while a visit to the city's fine parks is a delight to the lovers of nature.

The Spirit of Coöperation

One of the most striking and most gratifying features of the Medical Week is the whole hearted unanimity with which the various organizations have pledged their coöperation.

The numerous meetings of the General Committee on Arrangements have been attended by members representing the Canadian Medical Association, the Canadian Public Health Association, and the Health Officers' Association, many of whom have repeatedly travelled long distances to be present and share in the discussion of the necessary preparations.

The Committee is confident that this enthusiasm must pervade the whole meeting, and that the spirit of fraternal coöperation, so evident from the outset, will continue to animate the profession long after the Convention has become a memory.

In the preparation of the programme the utmost care has been exercised to assign to each body represented sufficient time for the discussion of subjects peculiarly its own, and to avoid the

duplication of papers or the repetition in any section, of subjects which may have been discussed in another.

The number of topics, the high standard of excellence of the papers to be presented, and the facilities afforded for thorough discussion should ensure a maximum attendance of the medical profession, and a permanent place for this Congress in the annals of Canadian Medicine.

Appeal to County Societies

For the first time in the history of the Ontario Medical Association, the County Medical Societies are this year afforded an opportunity of exercising a degree of influence commensurate with their importance. Under the new Constitution and By-laws of the Ontario Medical Association the County Society is recognized as the basic element of the Association.

The Committee of general purposes, as the legislative body of the Association, is composed of representatives elected from the County Societies in proportion to their membership. This plan has undergone the test of experience in the American Medical Association and reflects the growing spirit of democracy.

The Committee in charge hopes for a large representation of the profession outside the cities for this is necessary to prove and support the main idea underlying our new Constitution and By-laws.

SCIENTIFIC PROGRAMME

Monday and Tuesday

Canadian Public Health Association and Ontario Health Officers' Association

President's address (Canadian Public Health Association)—"A plea and a plan"—W. H. Hattie, Halifax.

President's address (Ontario Health Officers' Association)—H. W. Hill, London.

"The public health nurse"—J. A. Baudouin, Lachine.

Paper (title to be announced)—M. M. Seymour, Regina.

"Good public health service in small towns and rural municipalities"—J. J. Harper, Alliston.

"Hints on rural health administration"—J. W. S. McCullough, Toronto.

"The control of an outbreak of diphtheria"—W. C. Allison, Toronto.
"The trail of the medical vampire"—Frederick Paul.
"Health insurance"—Charles J. Hastings, Toronto.
"The venereal disease problem"—Gordon Bates, Toronto.
"Why is it worth while to establish sewerage in a small town?"—F. A. Dallyn, Toronto.
"Interpretation of water analysis"—H. M. Lancaster, Toronto.
"Mental hygiene"—Clarence M. Hincks, Toronto.
"Public health education"—Chas. F. Boldman, Toronto.

Child Welfare Section of Canadian Public Health Association—(Tuesday morning).

Chairman's address—Alan Brown, Toronto.

"Progress in child welfare work in Europe"—Grace L. Meigs, Washington.

"The result of three years' work in the department of child hygiene"—Geo. Smith, Toronto.

"The medical student in his relation to infant and child welfare work"—Richard Bolt, Cleveland.

"The management of a child welfare week in small cities and towns with results"—Mary Power, Toronto.

Round table discussion and a subscription luncheon.

Wednesday, 9.00 a.m.

Canadian Association for the Prevention of Tuberculosis,

Addresses of welcome by the Mayor of Hamilton, Charles G. Barker; the President of the Ontario Medical Association, J. P. Morton; and others.

9.30 a.m.

Social and Public Health Aspects of Tuberculosis:

The Secretary's report—Geo. D. Porter, Toronto.
"Role of health officers in the control of tuberculosis"—H. W. Hill, London.
"President's address"—J. A. Machado, Esq., Ottawa.
"Heliotherapy by the Rollier method as applied to surgical tuberculosis" (with lantern views)—J. H. Pryor, Buffalo.

2.00 p.m.

Symposium on the Diagnosis and Treatment of Tuberculosis:

"Differential diagnosis"—J. S. Pritchard, Battle Creek.
"Sanitarium treatment"—A. F. Miller, Provincial Sanatorium, Kentville.
"Artificial pneumothorax"—C. D. Parfitt, Gravenhurst.
"Tuberculin treatment"—J. H. Elliott, Toronto.

8.15 p.m.

Combined General Session of all Associations:

President's address (Canadian Medical Association)—H. Beaumont Small, Ottawa.

Symposium on the Returned Soldier Problem:

"Psychogenetic conditions in soldiers, their ætiology and treatment"—Lieutenant-Colonel Colin Russel, C.A.M.C.
(Title to be announced)—Colonel I. H. Cameron, C.A.M.C.
(Title to be announced)—Lieutenant-Colonel Hadley Williams, C.A.M.C.

Thursday, 9.00 a.m.

Canadian Medical Association and Ontario Medical Association

Meetings of Sections.

2.00 p.m.

General Sessions:

The Address in Obstetrics.—"Methods and operations for reducing fœtal mortality with special reference to newer methods of Cesarean Section"—Joseph DeLee, Chicago.
The Address in Pediatrics—"Asthma in infancy and childhood"—Isaac A. Abt, Chicago.
The Address in Medicine—"On the significance of heart murmurs found in the examination of candidates for military service"—Lewellys F. Barker, Baltimore.

7.30 p.m.

General Session:

The Address on the Ear—"Equilibrium and vertigo with special reference to aviation"—Isaac H. Jones, Philadelphia.

Friday, 9.00 a.m.

Ontario Medical Association and Canadian Medical Association

Meetings of Sections.

2.00 p.m.

General Sessions:

Symposium on Intra-Cranial Pressure:

"Physiology"—J. J. R. Macleod, Cleveland.
"Medicine"—W. F. Hamilton, Montreal.
"Surgery"—A. E. Garrow, Montreal.

7.30 p.m.

General Sessions:

The Address in Surgery.
"Cancer"—Chas. H. Mayo, Rochester.

"Medical impressions of the day"—Frank Billings, Chicago.

PROGRAMME OF SECTIONS

Section in Medicine

"Modern methods in diagnosis of nephritis"—W. G. Lyle, New York.
"A clinical study and treatment of bronchial asthma"—I. Chandler Walker, Boston.
"The prevention of war neuroses (shell shock)"—Thaddeus Hoyt Ames, New York.
"Pathology of pneumonia in military camps"—W. G. MacCallum, Baltimore.
"Psychoanalytical subject"—Beatrice M. Hinkle, New York.
(Title to be announced)—Thomas McCrae, Philadelphia.
"Chorea"—Alan Brown, Toronto.

Section in Surgery

"Surgery of colon"—E. McGuire, Buffalo.
"Radical operation for cancer of the breast"—D. Guthrie, Sayre, Pa.
"Fractures of the hip"—M. S. Henderson, Rochester.
"Carrel-Dakin treatment of wounds and paraffin wax treatment of burns"—William O'Neil Sherman, Pittsburg.
"The training of the surgeon"—Jasper Halpenny, Winnipeg.
"Observations on post-operative management of abdominal cases"—W. R. Thomson, Warsaw, N.Y.
(Title to be announced)—E. R. Secord, Brantford.

Section in Obstetrics

"Normal labour"—Irving W. Potter, Buffalo.
"Practical infant feeding for the general practitioner"—Douglas Arnold, Buffalo.
"The late repair of injuries due to labour"—W. H. Weir, Cleveland.
"The technique of operations for the repair of the perineum"—B. P. Watson, Toronto.
"Results of various measures in the treatment of cancer of the uterus"—F. A. Cleland, Toronto.
"The toxæmia of eclampsia"—K. C. McIlwraith, Toronto.
(Title to be announced)—F. A. L. Lockhart, Montreal.
(Title to be announced)—D. Evans, Montreal.

Section in Ophthalmology

"Fundus Oculi of Birds"—Major Casey Wood, Chicago.
"Management of cases of Simple Glaucoma"—Walter Parker, Detroit.
"Focal infection of the eye with special reference to the intestinal tract. A proposed new method of treatment. Reports of cases"—J. G. Dwyer, New York.
(Title to be announced)—E. Blaauw, Buffalo.
(Title to be announced)—John Wheeler, New York.

The Section in Laryngology, Otology and Rhinology

"Teaching of plastic surgery of the head and neck"—Joseph C. Beck, Chicago.

"The value of radium in the treatment of lesions of the eye, ear, nose and throat"—Gordon B. New, Rochester.
"Nasal accessory sinuses"—Robert R. Ridpath, Philadelphia.
"Protein-allergy of nose and throat with special reference to food and pollen proteins; résumé of three years work"—J. G. Dwyer, New York.

An Apfeal for Discussions

The Committee on Programme have pursued a policy as far as it was possible of bringing here our brethren to the south of us to give many of the papers, and are asking that the men on this side of the line supply the discussions. As is well known the usefulness and effectiveness of any paper no matter how excellent, is seriously impaired by the absence of critical discussion, the latter is really of more importance. Not only then from the standpoint of importance, but also from the spirit of courtesy and hospitality, the committee confidently hope that our members will volunteer cheerfully to assist in the programme, and show by their interest the appreciation we all feel of the presence of the men who have come (many at great personal inconvenience) to help make this a record meeting.

Synopses of papers will be sent to those making application.

Saturday

The Hamilton Clinical Day

Dr. Charles Mayo, of the Mayo Clinic, Rochester, and Dr. Frank Billings, of Chicago, will conduct a combined Medical and Surgical Clinic on the following types of cases:

(a) Goitre—exophthalmic, simple and toxic.
(b) Anæmias.
(c) Focal infections.

Members having interesting cases on any of these types are invited to report them to the executive of the Hamilton Medical Society.

The Round Table

On Thursday at 9. p.m. after the regular programme, there will be held a "Round Table Discussion" on a subject of vital interest to the profession. All seats will be reserved. The officers of each Association and of each County Society will be given an allotment

of the available accommodation. Chairs not applied for before Thursday morning will be thrown open to the general membership.

It is expected that in an informal manner, an opportunity will be given for the introduction of various shades of opinion on the underlying principles which govern our practice, our relations and duties to the general public.

The Ontario Lænnec Society

The Ontario Lænnec Society will hold its meeting on Tuesday afternoon and evening, May 28th, beginning at 2 o'clock. Complete arrangements will be announced later.

Business Programme

Monday and Tuesday

The Business Sessions and Executive Meetings of the Ontario Health Officers Association and the Canadian Public Health Association will be arranged for by each Association later.

Tuesday Evening, 8.30 p.m.

Ontario Medical Association.
Meeting of the Committee of General Purposes.

Wednesday Morning, 9.00 a.m.

Ontario Medical Association. Business Session.

10 a.m.

Canadian Medical Association. Business Session.

Wednesday Afternoon, 4 p.m.

Canadian Association for the Prevention of Tuberculosis.
Election of Officers.

Thursday Afternoon, 4.30 p.m.

Ontario Medical Association. Business Session.

Friday Afternoon, 4 p.m.

Canadian Medical Association. Business Session.
Report of Special Committee on Resolutions.

Scientific Exhibits

The attention of members of the various Associations taking part is drawn to the fact that there will be a most interesting collection of Scientific Exhibits. There will be a pathological exhibit of museum specimens in the personal charge of Dr. Maude E. Abbott of Montreal. This will include among special features a large exhibit of specimens from the National War Museum of Canada, shown by permission of Surgeon-General Fotheringham; an exhibit from the Babies' Hospital, New York, showing a number of specimens illustrating pneumonia in children; from the McGill Museum, the London Museum; and others. It will also include pathological material illustrative of papers being read in the various Sections. Members are cordially invited to send material illustrating their papers, or other specimens the exhibition of which would be of interest to any of the Associations participating in this Congress, addressed to the Committee on Scientific Exhibits, Canadian Medical Week in Hamilton, Royal Connaught Hotel, Hamilton. Express transportation charges will be paid on delivery by the Local Committee, and all parcels should be in the hands of the Committee not later than May 25th. Cards or labels giving full details about each specimen should be attached. All communications upon material for exhibition and inquiries about packing and shipment may be addressed to Dr. W. R. Jaffrey, 46 Hughson Street, S., Hamilton.

There will be a series of demonstrations of clinical laboratory procedures of special interest to the general profession, such as public health diagnostic tests; syphilis bacteriology, pathology and serology; alveolar air; kidney pathology and function; blood grouping and transfusions, technique; frozen section technique for surgical pathology and other procedures.

Moving pictures on medical and surgical subjects will be shown daily, between 4 and 6 p.m., in a convenient lecture hall. The subjects of these films will be such as to interest particularly the general practitioner and will deal more especially with the surgical aspects of conditions resulting from the war.

An exhibit of *x*-ray plates will be shown in a large room set aside for the purpose and equipped with efficient illuminating boxes. A good projection lantern is provided for the demonstration of lantern slide reductions from the plates. Invitations are being sent out to the men throughout the country, doing *x*-ray work, asking them to send any plates of unusual interest,

which will be placed on display. An informal demonstration of this kind will be made daily. A number of plates illustrating papers being read in the various sections will be on exhibition in this room. There will be an exhibit of some of the newer apparatus developed during the past year for the use of the American army at the front, in the way of portable field apparatus and instruments for precise localization of foreign bodies.

A number of posters illustrating the work carried on by the Canadian Association for the Prevention of Tuberculosis will be shown.

There will be a display of the charts, illustrations and literature from the Propaganda Department of the American Medical Association. In connexion with this there will also be a continuous lantern demonstration of slides illustrating the work carried on by this Association.

All material illustrative of papers being presented in the various sections, or in the general meetings, will be placed on exhibition and withdrawn for use during the reading and discussion of the papers.

In connexion with the Returned Soldier Problem, a number of the methods illustrating the reëducation of the returned men will be demonstrated.

Special Entertainment

At this large Congress of Canadian Medical Associations the main consideration will be the presentation of the Scientific Programme. The Local Committee wish to announce that with due respect for war conditions, the usual banquet will not be held this year.

In place of this, four informal table d'hote dinners will, on Monday, Tuesday, Thursday and Friday, be served in the large Assembly Hall at 6.30 p.m. Immediately following each dinner, the "Address of the evening" will be given.

On Wednesday afternoon the members have been invited to proceed to the Mountain Sanatorium where high tea will be served. Ample opportunity will be given to inspect the buildings, plant and grounds at this institution.

On Friday evening a smoking concert will follow the scientific programme.

On Saturday at 1. p.m. at the close of the clinic at the hotel, the members will be taken by motor to the new Hospital on the

Mountain, where through the courtesy of the Board of Governors of the city hospitals they will be entertained at luncheon.

"It has been suggested that the Thursday dinner be especially assigned to Class Re-Unions and Sectional Dinners. Those who are interested in either should correspond with the Local Committee without delay. Accommodation can be had for a few in private dining-rooms. It will be necessary to arrange for others by assigning tables in the large Assembly Hall. The Sub-Committee on Entertainment would like to hear from any who would agree to assist in the organization of a Convention Choir. Those who are in the habit of assisting in such choral work or any who may desire to help, should communicate with Dr. E. F. McLoghlin, 452 Main St. E., Hamilton, without delay, who will supply them with song sheet and other details. Members who know of any who should be invited to assist by contributing instrumental music will please coöperate."

Hotels

The headquarters for the Canadian Medical Week are in the Royal Connaught Hotel which has placed ample accommodation at our disposal for the meeting. Rates in this hotel run from $1.50 to $3.50 per day.

The following hotels are in close proximity to the headquarters:

Wentworth Arms, Hughson St., cor. Main St., $1.50 to $3.50 (European).

Stroud, cor. McNab and Merrick Sts., $2.50 to $3.50 (American).

King George, cor. McNab and Market Sts., $1.00 up (European).

New Commercial, 51 York St., $1.25 to $3.00 (European).

Hanrahan, 92 Barton St. E., $2.00 (American).

Terminal Hotel, King St. E. $2.50 (American).

The rates quoted in each case are on the assumption that the rooms are used to the full capacity.

We have been assured that there will be no difficulty in billeting all our guests.

RAILWAY RATES

In the last issue of the Journal we published a statement to the effect that the usual reduced rates had been granted by the railways. This concession has since been withdrawn by the railways at the request of the Canadian Railway Association for National Defence. While this will no doubt be a disappointment to many of our members, it is to be hoped that it will not have any serious effect upon the number attending the meeting.

Automobiles

For the assistance of those who take advantage of the motoring facilities it may be stated that garage accommodation will be ample and the rates reasonable.

Garages

Jolley Sales Garage, Catharine St. South.
Ford Motor Co., John St. North.
Overland Sales Co., John St. North.
Citizens Taxi Co., King St. East.
O. & R. Garage, Hughson St. South.
East End Garage, King St. East.

At its recent meeting the Council on Scientific Assembly arranged for meetings of the Section on Miscellaneous Topics, the subject to be taken up being the reëducation and rehabilitation of the disabled soldier. Major Frank Billings, head of this division in the Surgeon-General's office, has accepted the chairmanship of the section.

There will be five days of clinics in connexion with the Convention beginning Thursday of the preceding week and continuing up to Tuesday of the Convention week. These clinics will be under the auspices of the Association and will be conducted by best clinicians.

The personnel of the Executive Committee is as follows: Ludvig Hektoen, chairman; C. J. Whalen, secretary; W. A. Pusey, treasurer; J. V. Fowler, H. T. Patrick, M. L. Harris, Frank Billings, J. B. Herrick, C. E. Humiston.

Obituary

DR. PETER CONROY

Dr. Peter Conroy, M.D., one of the most widely known and universally beloved physicians in the province, died at Charlottetown, P.E.I., March 14th. Dr. Conroy was ill but a short time and succumbed to an acute attack of pneumonia following a cold, contracted while visiting an out of town patient. A strong feeling of personal loss came to many hearts and homes when the sad news was announced. Two physicians were called in at an early stage of his illness, and, as the disease progressed, practically all the local physicians were in attendance almost every hour of the day, but medical skill proved unavailing and the spirit of this splendid man was called to higher service.

Dr. Conroy was born at Tignish, on March 20th, 1854. He was a son of Nicholas Conroy, M.L.A., who ably represented the Tignish district for a number of years in the local legislature. Dr. Conroy secured his education at Prince of Wales College, St. Dunstan University and Laval University, graduating from the latter institution as a doctor of medicine in June, 1864. He began practice in Charlottetown in 1878. He married Miss Emma Newbery, daughter of John Fenton Newbery, and leaves a family of three sons, two of whom are at the front serving with the 2nd Heavy Battery, formerly commanded by Major J. Webb Stanley. His sister, Miss Margaret Conroy, formerly a matron of the Dalton Sanatorium, now fills the position of nursing specialist in Boston.

The late Dr. Conroy was Dominion quarantine officer; he was a director of the Charles Dalton Silver Fox Company; a trustee of Falconwood Provincial Hospital, in which he took a keen interest rendering valuable services to its administration; he was chief house physician of the Charlottetown Hospital; a member of the Board of Governors of St. Dunstan University; and president of the Children's Aid Society. His death is a distinct loss to the civic, professional, and social life of his native province. Unselfish, kind, companionable and genial, he filled an enduring place in the hearts of all who were privileged to know him.

DR. A. E. HANNA

Dr. A. E. Hanna, M.P., passed away just after being elected a member of the House. Reference to his death was made by the Prime Minister and the Leader of the Opposition before the session was suspended. Dr. Hanna had been member for South Lanark for several years. Though he had had but a brief parliamentary career, Sir Robert Borden said all those who were associated with him could bear witness to his strong devotion to duty, his intelligent grasp of public questions, and his desire to fulfill worthily the responsibility resting upon him as a member of the House. He was confident all would join in extending to his family very deep sympathy in the bereavement and loss which they had sustained.

Sir Wilfred Laurier followed with remarks full of appreciation. He referred to Dr. Hanna's useful membership and honourable citizenship, and joined the House in extending its condolence to the family.

DR. ALEXANDER FRASER

The death of Dr. Alexander Fraser, in the sixty-second year of his age, occurred at Pasadena, California, on March 6th. Dr. Fraser was born at Port Bruce in 1856. He was a graduate of McGill University. He lived for some five years in Manitowac. He practised in Embro for two years. In 1912 he moved to Pasaden. Dr. Fraser was a man of sterling character, highly esteemed by all who knew him.

DR. OSWALD MEREDITH JONES

Dr. Oswald Meredith Jones, one of the most eminent surgeons of the North American continent, closed a life of supreme usefulness in the Jubilee Hospital, Victoria, B.C., after a comparatively short illness. Death was directly due to pneumonia.

The members of the Victoria Medical Society held a meeting on April 5th, to put on record the irreparable loss they felt, not only the Province but the whole Dominion had sustained. No citizen of British Columbia ever achieved a higher degree of public service, or filled a more useful life. The medical profession had lost more than a brilliant surgeon, they had parted with a personal friend; of his strength and skill he gave unsparingly to all. Dr.

Jones was born fifty-nine years ago in Carnarvon, Wales. He began his medical training in the London Hospital; he passed into the navy and it was in his first commission, on H.M.S. Warspite, that he came to Victoria about twenty-eight years ago. In this city he began his civilian practice and his reputation as a skilled surgeon soon spread up and down the coast. Dr. Jones was a Fellow of the Royal College of Surgeons, a Fellow of the American College of Surgeons and one of the charter members at the time of the inception of this organization, and a member of the British Medical Association. He was on the board of examiners for the Dominion of Canada, and also for the Province of British Columbia. He has read notable papers before the Canadian Medical Association.

Dr. Jones married a daughter of Mr. Brady, the well-known mining engineer of Kootenay. He leaves a widow and five children. One of his sons is now in France having gone overseas with the Army Medical Corps. On account of physical disability Dr. Jones was unable to serve at the front, but he nobly did his part when the wounded returned. In this service he exhausted his narrow margin of vitality and to his unceasing devotion to duty is due his untimely death. His great surgical ability was called into special demand; in addition to his regular practice he attended hundreds of cases of wounded men who returned in ever increasing numbers. Scores of cripples, who were so battered by war that they could only creep about on crutches, have been, through his skill, restored and literally "made whole". During the last few days of his life touching instances occurred of the unbounded gratitude and confidence he always inspired. Some of his soldier-patients refused to have surgical attention from any other physician, willingly enduring racking pain in the hope that he would soon be able to return to them. Many a war-torn soldier stands whole to-day a living monument to the devoted and generous part Dr. Jones did in the great war. Modest, unassuming, courageous, he shirked no duty nor failed in any emergency.

Dr. Sarem M. Ellison died suddenly on March 26th. He was for many years a prominent physician of New York city. Dr. Ellison was born and educated in St. Thomas, Ontario, and up to the time of his death periodically visited his native city. He was a graduate of McGill University.

Dr. C. Eckel died at St. Thomas, March 16th, after a long illness. Dr. Eckel lived in Brantford where he enjoyed a fine practice until he was stricken about a year ago.

Dr. W. J. G. Dawson, superintendent of the State Hospital in Eldridge, died in California recently at the age of seventy.

The death of Dr. Armstrong removes a public spirited man who held the esteem and good will of every one. Dr. Armstrong was born in Bayfield, Ontario, educated at Goderich High School, and afterwards at Toronto University. He died at Tara on March 12th.

The death of Dr. Francois Xavier Valade, of Ottawa, removes a well-known landmark of half a century. He was born in Terrebonne and at the age of nineteen he graduated in medicine from Laval University. Coming to Ottawa to practise medicine fifty-one years ago he is identified with that city's early history. He was a member of the original board of the Water Street Hospital and had much to do with its progress and growth. He was the attending physician of many institutions, the homes for the aged, the Grey Nuns, the convent of the Precious Blood, and others. He was instrumental in the formation of the Institut Canadien, a former president of St. Jean Baptiste Society, and also a member of L'Union St. Joseph.

Dr. T. V. Hutchison, for twenty-five years medical health officer for London, Ontario, died at his residence in Toronto on March 28th.

Miscellany

News

MARITIME PROVINCES

A SPECIAL meeting in Halifax of the city Board of Health was called to discuss precautions taken against smallpox. The chairman, Dr. McKay, said the main object of the meeting was to consider the advisability of vaccination, and consideration of the conscientious clause. It was urged that the reconstruction workmen should be vaccinated, and the repairs be hastened on the smallpox hospital especially required for the workmen. From four applications for the dual position of superintendent-matron, Mr. and Mrs. McKillop were accepted in view of their previous experience in hospital work.

A HOSPITAL is to be built in Halifax for the American Red Cross, or for soldiers and sailors of the United States who may become ill in the port or be brought to Halifax needing treatment. The site will adjoin the Nova Scotia Hospital.

FIVE cases of smallpox were reported in Sydney in March. At a recent meeting of the National Council of Women a resolution was passed endorsing the Government Bill on Venereal Diseases now before the legislature. Plans were also in formation to hold a "Child Welfare Day".

ON March 15th the Board of Health in the town of Glace Bay passed special regulations regarding the introduction of smallpox into the community. No persons residing in the adjacent towns can enter Glace Bay without a certificate signed by the health officers of said towns or from the municipality of Cape Breton County. Violators of the regulations will incur a fine not exceeding fifty dollars, or imprisonment in the county jail for a period not exceeding thirty days.

THE work of the St. John Ambulance Association proceeds

most satisfactorily. Dr. W. F. Roberts is the instructor and lately passed a large First Aid class. The examiners were Major L. M. Curren, Dr. F. L. Kenney and Captain Logie. Thirty-seven students presented themselves, and all succeeded in qualifying, many receiving high marks. Possessors of certificates in First Aid and Home Nursing were desirous of winning the Medallion of the association by passing a third class examination. Advantage was therefore taken of the very excellent and thorough instruction given by Dr. Roberts, with the result that nineteen young ladies will receive medallions from England. Sixteen members of the class will receive certificates of proficiency from Ottawa. The association feels that thanks are due to those who gave their valuable time and services to the instruction and examination of the classes.

ONTARIO

The last monthly meeting of the Ottawa Dental Society was held at the Russell House. Major Magee spoke on the Canadian Army Dentist Corps, particularly dwelling on that branch of the work which looks after the oral condition of soldiers returned from active service. The following officers were elected for 1918-19: president, Dr. W. C. Macartney; vice-president, Dr. Sidney W. Bradley; secretary-treasurer, Dr. G. S. Richardson; executive committee, Dr. W. K. Greene, Dr. A. G. MacMillan, Dr. J. G. Coupal.

Dr. Alfred Thompson resigns his position as medical superintendent of the hospital of returned soldier invalids. The replacing of the Military Hospitals Commission by the Invalided Soldiers' Commission makes it impossible for Dr. Thompson, being member-elect for the Yukon, to remain at his post because of the Independence of Parliament Act. His resignation took effect on April 1st. Under the regime of Dr. Thompson the work of the Military Hospital Commission expanded from the care of about five hundred invalided soldiers until provision was made for 12,000.

Dr. J. L. Chabot, M.P. for Ottawa, has declined the office of Deputy-Speaker.

The Victorian Order of Nurses will become affiliated with

the National Association of Nurses of Canada if the recommendation of the delegates is ratified by the Board of Governors.

Toronto hospitals are undergoing a considerable financial strain owing to the conditions enforced by the war. A consolidation of the city hospitals and their government under commission has been considered, but exceptionally well informed opinion seems to incline to the view that this plan, if carried out, would undoubtedly tend to check the flow of private philanthropy; they point out that all the advantages of the suggested consolidation, without its drawbacks, could be gained by forming a voluntary association of the hospitals of the city. In this way a standardized system of accounting would prove feasible, providing information enabling the expenses of management to be cut down. Centralized purchasing would result in very considerable economy. Centralized publicity, it is believed, would give larger donations.

A PROMINENT feature of the work of the Ontario Legislature this session has been the consideration of the bill to prevent venereal diseases. A special committee was appointed to the reading of the bill many members of which were medical men. It is expected that the Act will go into force about July 1st. That drastic legislation is universally desired for the prevention and compulsory treatment of venereal diseases is evidenced by the very large number of public meetings called in various parts of the Dominion to endorse the bill.

THE St. Thomas Medical Association waited upon the board of governors in control of Amasa Wood Hospital with the request that the institution should be taken out of the hands of the city council and placed under a trust and the accommodation increased. The doctors believed they could raise by public subscription the twenty or thirty thousand dollars needed.

THE annual meeting of the Hamilton Health Association showed good work accomplished during the year, in spite of the great difficulties created by war conditions. The directors' report outlined improvements undertaken at a cost of $26,700, which was defrayed out of the $47,450, raised by the campaign committee in May. The balance of this money, $20,750, will be used for equipment for the new infirmary, and balance then owing

for the double cottage and new infirmary building. On the association's invitation the National Association for the Prevention of Tuberculosis will hold its annual convention in Hamilton in May, in common with four other medical societies.

QUEBEC

THE Montreal Presbyterian College has not only handed over its entire building to provide hospital accommodation for returned invalided soldiers, but also the David Morrice Convocation Hall. This means that the divinity students residing in the college must find quarters outside. The military authorities will take over the college on March 15th.

THE Advisory Council for Scientific and Industrial Research for Canada have sent a deputation to the United States to confer with American research bodies. Dr. Ruttan, of the chemistry department, McGill University, said that the celebrated mustard gas, which probably had much to do with the reverse at Cambrai, is being manufactured on a large scale comparatively in the States.

THE board of governors of Notre Dame Hospital intend to build a million dollar hospital: construction will probably be begun before the war is over. Archbishop Bruchesi made the announcement at the annual meeting of the hospital.

LIEUTENANT-COLONEL (DR.) LeBel gave an able address at Garde Champlain Hall, under the auspices of the St. Vincent de Paul Society. The speaker described the work being done at the Canadian Hospital at St. Cloud of which he was commandant. Of the thousands of wounded soldiers who are being treated there, only five per cent. of them succumbed to their injuries, a fact of the utmost significance, as only the most severe cases are admitted to this hospital.

DR. A. A. SHEPARD, school medical officer of Sault Ste. Marie, reported to the Public School Board lately on the number of cases of infectious diseases found in the schools in the mouths of January and February. The effect of the recent measles epidemic disclosed the fact that the days lost by exclusion amounted to 4,891 in the ten schools of the city. The situation was taken well in hand and the epidemic put well under control. Additional

safeguards were enforced prohibiting children under fifteen attending moving picture shows or Sunday schools. An additional precaution taken was the return home of children showing the early cough, so characteristic of measles, and the systematic reporting and placarding of houses.

MANITOBA

Within the next year the Tuxedo hospital, a military institution, is to be extended to treble its present capacity. Plans are announced for the erection of a number of new buildings which will involve the expenditure of $1,000,000. The hospital will accommodate 2,500 patients including those who are being reeducated under the vocational training scheme.

An excellent report was made by the Grand Jury on the Brandon General Hospital and on the Hospital for the Insane. In the latter institution there are 647 patients. The staff numbers eighty-six. A good deal of the work of the hospital is done by the inmates; the women have knit a large number of socks for the Red Cross Society. The land connected with the hospital is finely stocked, and the farm showed a profit of $8,000 for the year of 1917. The Grand Jury found the staff of the Brandon Hospital working under adverse circumstances and recommended that the Provincial Government take over all the hospitals, and erect and maintain one in this populous centre.

SASKATCHEWAN

The Canadian Army Medical Corps will take over the military hospital in Moose Jaw with an increase of 150 beds. All medical men now holding commissions in the C.A.M.C. in Moose Jaw, and now on duty, remain on the staff. Only C.A.M.C. nurses will be employed.

In Regina a new military hospital is to be erected providing 300 beds. The city is expected to provide the site.

ALBERTA

In the new bill introduced by the Minister of Education and accepted by the legislature medical, inspection of schools has

been made compulsory. The Hospital Bill was reported for third reading. During the discussion authorizing steps for the formation of a hospital district, it was elicited that women as well as men, under certain definite conditions, were entitled to a vote. In the case of union hospitals supplying a district in Alberta and a contiguous one in Saskatchewan, a section was added authorizing the district in Alberta to raise the necessary money for the support of the hospital.

Dr. Mahood is drafting a by-law for the approval of the city of Calgary which will provide for compulsory medical inspection of all persons engaged in the handling of food. This is intended to minimize the danger of contagion, especially in the cases of tuberculosis and venereal disease. Regarding the latter Dr. Mahood stated that between 400 and 500 cases were being treated in Calgary at the present time.

BRITISH COLUMBIA

The monthly report of the Provincial Mental Hospital shows that at the beginning of February there were 1,320 patients, admitted. The Provincial Royal Jubilee Hospital has received a grant of $8,000 from the city council, and an additional grant of $1,000 a month, making a total of $20,000 for the year.

The establishment of a home, of the farm colony type, for the feebleminded is urged by Mrs. Manchester in her annual report to the Local Council of Women.

ARMY MEDICAL SERVICES

The Distinguished Service Order has been conferred upon Captain Gordon William Armstrong, who saw service with the Royal Army Medical Corps in France and Mesopotamia. He was granted his distinction for working in the open under continuous heavy shell fire, and for handling two hundred stretcher cases in two hours at the first aid post. Later he went to the aid of an officer and an orderly, carrying them from the danger zone, and though wounded himself he refused to leave his post until properly relieved. Captain Armstrong is a B.A., Victoria '13, and an M.B. of the Toronto University.

The Distinguished Service Order has been conferred upon

Major Kenneth McCormick, C.A.M.C., for remaining forty-eight hours at his post without rest, evacuating the wounded and searching shell holes until the last wounded man left.

The Military Cross has been awarded to Captain Dimrock Stanley Cassidy, R.A.M.C., of Winnipeg, Manitoba, formerly of the C.A.M.C. He went down in a mine shaft when a party of men were gassed and remained all night preparing and rendering first aid; nor did he leave his post even when seriously affected by gas.

Twenty-nine officers of the Canadian Army Medical Corps are gazetted to commissions in the Royal Army Medical Corps.

All hospitals now under the Military Hospitals Commission, except those treating cases of tuberculosis, insanity, epilepsy or incurable diseases, will be taken over by the Militia Department on April 1st. Lieutenant-Colonel C. L. McGuffin, assistant director of medical services in Military District No. 13, has returned from making arrangements to this effect at Ottawa.

Miss Nettie Bridges, V.A.D., and Miss Marion Crocket, V.A.D., both of Nova Scotia, have received the Red Bar which denotes they have served with efficiency one year in Military nursing.

The following members of the Canadian Army Medical Service Corps have been awarded the Military Medal.

Sergeants H. Morison and H. Wood; Corporals G. W. Waddington, R. G. Harding, A. K. Magner, B. M. Mitcheson and Lance-Corporal W. D. Watherston; and Privates J. Bell, A. W. Eaton, E. D. Emery, J. Erskine, H. D. Kitchen, A. L. Lansdowne, C. Pedlow, E. Badeau, H. V. Caton, J. Currie, D. P. Ewen, M. Hardy, R. M. Hill, and A. M. Stewart.

Lieutenant-Colonel R. M. Simpson, of Winnipeg, assistant director of medicals, is gazetted colonel.

Major J. W. Coulter, M.D., has been appointed to the responsible office of president to a travelling board in England.

Captain Freer Richardson, lent by the C.M.S., of London,

England, to take charge of the army hospital stationed at Bagdad, has been transferred to Mesopotamia.

Captain D. M. Warren, M.D., has resigned from the R.A.M.C., and been given a commission in the C.A.M.C., and appointed to the King's Canadian Red Cross Hospital at Bushy Park, Middlesex.

Captain H. J. Watson, M.D., of Winnipeg, has resigned his commission as Captain in the C.A.M.C., and been appointed Major in the United States Medical Reserve Corps. He served with the C.A.M.C. from January, 1916, to November, 1917. He recently served on the staff of the director general of the Medical Services, Ottawa. Dr. Watson formerly served with the United States army in the Philippines. He is a graduate of Trinity, and also holds the degree of M.D. from the University of Manitoba.

Surgeon F. W. Leech, a graduate of Medical Class '17 of the Toronto University, has been attached to the Royal Navy and listed for foreign service. In 1915 he went overseas and was attached to headquarters staff of the 4th Brigade. He returned to Canada to complete his course and went back to the front on graduation.

Dr. J. A. Harvie, Ontario, has three sons serving at the front, all of Toronto University, and two in the medical profession. Captain R. M. Harvie was formerly with the British unit at Salonika and is now on the medical board at Folkestone, while Horace H. Harvie is a surgeon at a casualty clearing station in France.

Captain D. G. McKay, who left in August, 1916, with the C.A.M.C., has returned to Canada. The doctor was nine months in the trenches and was then invalided to England after being gassed.

Captain Cleveland Roy Wilson is on his way to the front. The captain was formerly on the staff of the Hospital for Sick Children, Toronto, and was later on duty at Exhibition Camp; he afterwards went to Hamilton from whence he was one of seven doctors drafted to proceed overseas.

Major J. Cameron Wilson, Major G. C. Hale and Major J. G. Hunt are returning to Canada. Major Wilson left London, Ontario, on the declaration of war, with No. 16 Field Ambulance. Later he returned and went overseas with the Western University Hospital. Major Hale is a son of the late Mr. Jeffrey Hale. He went overseas as medical officer of the 18th Battalion; later he transferred to a hospital unit. Major Hunt has served with the Russian army in Russia and Roumania.

Surgeon-General R. H. Featherston, of the Anzacs, is visiting the military district of Ontario to tour the military hospitals in order to gain information as to the best method of handling the returned soldier problem in Australia.

CASUALTIES

Killed in Action

Captain St. Clair Dunn (formerly of the Princess Patricias).

Wounded

J. C. Weatherby, Vancouver.
S. Tomer.

Canadian Literature

Original Contributions

The Public Health Journal, February, 1918:

The advisory committee on venereal diseases for Military District No. 2
Major J. G. Fitzgerald.

Book Reviews

LORD LISTER. By SIR RICKMAN JOHN GODLEE, Bt., K.C.V.O., M.S., F.R.C.S. 663 pages. Price 18/- net. Publishers: The Macmillan Company, London, New York, and Toronto, 1917.

Sir Rickman Godlee's biography of Lord Lister is excellently done. As Lord Lister's nephew he has had access to all possible documents, and doubtless to personal information which any other biographer would have lacked. As his nephew, too, the work has undoubtedly also been a labour of love, so that we have before us one of the best of medical biographies. The perusal of the book has been extraordinarily interesting. As one turns the last page and thinks back upon the six hundred odd pages that have gone before, one realizes how very vivid Sir Rickman has made the picture of the great man's life; and the vividness of the impression is the measure of a good biography.

The picture shows us a man whose chief characteristics were intense earnestness in the pursuit of knowledge, great insight into the conditions of any given problem, extraordinary industry and patience in detail; and to crown the whole, that faith in his conclusions and tenacity of purpose in the face of most discouraging opposition without which the whole great idea of antisepsis might have suffered eclipse for many years. There are other aspects of the picture, hardly less interesting than that which concerns the great work with which his name is associated; aspects of the man in his personal relations to colleagues; with the sick poor; of his early Quaker training; of his married life, to name only a few. He was uniformly kind to the sick, patient though positive in debate, pertinacious in following high ideals both humanitarian and scientific. As to his literary style, he had a command of fine English, clear, if not concise. One other impression which the picture as a whole gives us is that he seems to have lacked entirely a sense of humour. Whether this was really the case or was the fault of his biographer, one cannot say. Are the Quakers devoid of humour? There were other small defects in his character. For instance, he appears to have always been late for his appointments, and when speaking in public he apparently lost track entirely of time. At one

meeting of the British Medical Association in an afternoon session where two hours were allotted for six papers, Lister came on first and took up the whole two hours with his own paper. What the feelings of the five other readers were history sayeth not. Perhaps such lapses can be pardoned to genius. And if genius consists in the capacity of taking infinite pains, then was Lister certainly a genius.

It would naturally be impossible to mention all the interesting things that are set down in this book. Let it suffice to recommend its perusal not only to the medical but also the lay reader. It is worth a good deal of time.

MODERN DENTISTRY. By JOSEPH HEAD, M.D., D.D.S. of Philadelphia. W. B. Saunders Co., Philadephia and London.

The trend in medicine is to direct more and more attention to the great question of prevention of disease. It is only recently that the profession generally has realized the importance of mouth infection as a cause of disease elsewhere. As is the case with any advance, certain men have gone too far and expect too much. This should not be brought as a reproach against the necessity of recognizing the far reaching effects of mouth infection and the need of correction when such exists.

Many of the profession, both medical and dental, have not awakened to the importance of these recent developments. The medical profession can do much by supporting the dentist who is awake to the newer methods of diagnosis and treatment and has the ability to carry them out. It is altogether likely that in the dental profession, at any rate in the larger centres, certain men will devote themselves particularly to the treatment of mouth infection, but there is no reason why dentists everywhere should not be familiar with the subject. This work of Dr. Head's represents a study of modern methods in dentistry with particular attention given to the subject of mouth infection. The parts of it that deal with dental procedures are perhaps not of special importance to us medically, but even here the physician will find much that is of interest.

Dr. Head deals at length with the methods of prevention of mouth infection and lays particular stress on it. It is a question how many people know how to keep their mouths in proper condition. Investigate carefully the condition of the mouth in the next fifty patients you see, whatever walk in life they come from, and you will conclude that but a small proportion attend to

it efficiently. The proper method of cleaning the teeth is described in detail. One point deserves to be emphasized; that it should be possible to brush the teeth with as much force as one brushes the finger nails. How many people can do this without discomfort? A proper method renders this perfectly possible.

Of particular importance are the chapters dealing with the subject of mouth infection. Too often we fail to look for it or may not know how to recognize it when present. Dr. Head devotes a chapter to the discussion of the use of vaccines in the treatment of mouth infections. Naturally there is a great deal of difference of opinion as to their value. Dr. Head emphasizes the need of small doses being given at first and that any increase should be very carefully made. While the removal of the focus of infection is sufficient in many cases yet in others a subsequent course of treatment by vaccines is undoubtedly of value. In the cases of anæmia due to mouth infection the use of vaccines seems undoubtedly useful. The section on the care of the teeth in childhood should be useful to many practitioners.

In the recognition of mouth infection, a great deal depends on the proper use of the *x*-rays and the book concludes with a chapter concerning this, illustrated by a number of interesting plates. Both professions need to learn the lesson, and especially the dentist, that a tooth may not give any pain or show any external signs of disease, and yet have an abscess at the apex. For the recognition of these the *x*-rays are necessary. There is no excuse for an attitude of hostility between the two professions and with proper methods and careful study it should be possible to determine when teeth should be removed. To remove teeth recklessly and on chance is almost criminal; to keep a focus of infection is perhaps worse.

Altogether this book may be highly commended to the members of the medical professsion as dealing with a "border line subject" in which both physician and dentist should be equally interested and in which team play is very essential for the best welfare of the patient.

Diseases of Women. By Harry Sturgeon Crossen, M.D., F.A.C.S., associate in gynæcology, Washington University Medical School. Fourth edition, revised and enlarged, 1125 pages with 800 engravings. Price $7.50. Publishers: C. V. Mosby Company, St. Louis, 1917.

This splendid work has now reached its fourth edition, and

has been thoroughly revised, and brought up to date by the author. The fact that the work has run through these additions in such a short time is proof of its many good quantities, especially in these days when there are so many excellent books on this subject available for the purchaser. This work is got up in most attractive form. The binding, paper, illustrations, and typography are such as appeal to the reader and add much to the pleasure of reading this volume. We wish to express our full measure of praise to both author and publishers, and also to commend the work to our readers.

HAND BOOK OF GYNÆCOLOGY FOR STUDENTS AND PRACTITIONERS. By HENRY FOSTER LEWIS, A.B., M.D., professor and head of department of obstetrics and gynæcology in Loyola University School of Medicine, and ALFRED DE ROULET, B.Sc., M.S., M.D., professor of gynæcology in Loyola University School of Medicine. With one hundred and seventy-seven illustrations. C. V. Mosby Company, St. Louis, 1917.

This volume of 450 pages covers the essentials of gynæcology in a careful and scholarly manner. The text matter is very well arranged, and thereby more convenient for the reader. The book will prove a very useful guide for such as may consult its pages. It is beautifully illustrated, printed and bound; and is well worthy of cordial recommendation to the profession.

THE PRACTICAL MEDICINE SERIES; comprising Ten Volumes on the Year's Progress in Medicine and Surgery. Under the editorial charge of CHARLES L. MIX, A.M., M.D., professor of physical diagnosis in the Northwestern University Medical School. Vol. I, GENERAL MEDICINE. Edited by FRANK BILLINGS, M.S., M.D., head of the medical department, and dean of the Faculty of Rush Medical College, Chicago. Series 1917. The Year Book Publishers, 608 S. Dearborn Street, Chicago.

This volume covers the ground of general medicine. There is a section on research work, one on infectious diseases, one on diseases of the chest, one on the heart, one on the blood, one on the ductless glands, one on metabolism, and one on the kidneys. These topics are well written up. The author has a clear style and can tell in a reasonable space the essentials regarding the subject of discussion. This should prove a very attractive and useful series. The volumes are small and can be read with pleasure, or taken with one if going on a trip anywhere.

Books Received

THE following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

MEDICAL ELECTRICITY. A Practical Handbook for Students and Practitioners. By H. LEWIS JONES, M.A., M.D., F.R.C.P., late consulting medical officer to the electrical department in St. Bartholomew's Hospital. Seventh edition. Revised and edited by LULLUM WOOD BATHURST, M.D., physician in charge of electrotherapeutic department, Royal Free Hospital, London. 561 pages with illustrations. Price 15 – net. Publishers: H. K. Lewis & Co., 136 Gower Street, London W.C. 1, 1918.

TUMOURS, THEIR NATURE AND CAUSATION. By W. D'ESTE EMERY, M.D., B.Sc., director of the laboratories, King's College Hospital. Price 5/ – net. Publishers: H. K. Lewis & Co., 136 Gower Street, London W.C. 1, 1918.

THE SYSTEMATIC TREATMENT OF GONORRHŒA. By N. P. L. LUMB, temporary Captain, R.A.M.C., 116 pages. Price 4/6 net. Publishers: H. K. Lewis & Co., 136 Gower Street, London W.C. 1, 1918.

THE NAUHEIM TREATMENT, IN ENGLAND, OF DISEASES OF THE HEART AND CIRCULATION. By LESLIE THORNE THORNE, M.D., B.S., M.R.C.S., L.R.C.P., late medical officer London County Council Technical Educational Board. Fifth edition, 160 pages. Price 5/– net. Publishers: Baillière, Tindall & Cox, 8 Henrietta Street, Covent Garden, London, 1918.

AIDS TO RATIONAL THERAPEUTICS; with U.S.A. Pharmacopœia, Equivalents. By RALPH WINNINGTON LEFTWICH, M.D. C.M., M.R.C.S., late assistant physician to the East London Children's Hospital. 228 pages. Publishers: Baillière, Tindall & Cox, 8 Henrietta Street, Covent Garden, London, 1918.

MANUAL OF VITAL FUNCTION TESTING METHODS AND THEIR INTERPRETATION. By WILFRED M. BARTON, M.D., associate professor of medicine, Georgetown University. 311 pages. Price $2.00 net. Publishers: Boston, R. C. Badger, The Gorham Press: Toronto: The Copp Clark Co., 1917.

CANADIAN MEDICAL DIRECTORY. Containing the law of the reciprocity of license between the United Kingdom and the Britannic Dominion; the law and regulations of the Medical Council of Canada with the list of the licentiates; the medical societies, hospitals, etc., of each province; the laws and regulations for the practice of medicine, surgery and midwifery in the different provinces. With complete alphabetical index of physicians of the Dominion. First edition. Price $3.00. Edited by N. W. MOORE, M.D., 6456 St. Mary Street, Montreal, 1918.

THE SPLEEN AND ANÆMIA: EXPERIMENTAL AND CLINICAL STUDIES. By RICHARD MILLS PEARCE, M.D., Sc.D., professor of research medicine; and others. 500 pages with 16 illustrations. Price $5.00. Publishers: J. B. Lippincott Company, Philadelphia, London, and 201 Unity Building, Montreal, 1918.

TRANSACTIONS OF THE AMERICAN UROLOGICAL ASSOCIATION. Sixteenth Annual Meeting at Chicago, April 2nd, 3rd, 4th, 1917. Vol. XI. Published by RICHARD FOTHERINGHAM O'NEILL; and others. Printed for the Association at the Riverdale Press, Brookline, Mass., 1918.

INTERNATIONAL CLINICS. Edited by H. R. LANDIS, with the collaboration of Chas. H. Mayo; and others. Volume I. Twenty-eighth series, 1918. Price $2.50. Publishers: J. B. Lippincott Company, Philadelphia, London, and 201 Unity Building, Montreal, 1918.

Medical Societies

MONTREAL MEDICO-CHIRURGICAL SOCIETY

THE sixth regular meeting of the society was held Friday, December 21st, 1917, Dr. A. E. Garrow, president, in the chair.

LIVING CASE: "Round celled sarcoma," Dr. A. E. Garrow.

The patient is thirty-one years of age and on August 20th, while working on his farm and carrying a pitchfork over his shoulder for some time, he noticed a lump developing on the outer aspect of his clavicle. He then came to the hospital with a mushroom-like swelling occupying the upper third of the clavicle, tender to pressure but not limiting the movements of the shoulder to any extent. A small portion was removed for examination and a small celled sarcoma was discovered. Two days later we did a block dissection, involving the outer half of the clavicle and the whole of the growth right up to the head of the humerus and all the soft tissues around it, removing the clavicle and disarticulating it from the acromium process. The patient remained well for some time, and in spite of the loss of parts, fair movement was maintained. Four or five months later he again returned witha rapidly developing mass running up along the anterior portion of the trapezius muscle. Induration also felt in the posterior triangle. This was on January 10th and we made another block dissection of all the structures of the posterior triangle including one half of the trapezius muscle, dissecting it away from the spine of the scapula and removing everything along the internal jugular vein right up to the base of the skull. Immediately after that, and since then, he has been getting x-ray treatment and up to the present moment there is not the slightest evidence of any induration or recurrence and in spite of the maiming operation this patient is able to do practically everything with his hand as before. Dr. Oertel reported it a very rapidly growing round celled sarcoma, periosteal in type.

PATHOLOGICAL SPECIMENS: Dr. C. T. Crowdy exhibited a series of specimens in the absence of Dr. H. Oertel.

1. The first case illustrates a rather interesting combination of two well-known pathological lesions, tuberculosis and carcinoma. This is relatively rare and is the first case we have seen in our department since Dr. Oertel's appointment three years ago. The

patient was a man aged sixty-one, a harnessmaker, Canadian, admitted to Dr. Garrow's service with the complaint of "soreness in the mouth." About four months before admission he noticed a small lump on his tongue. He consulted a physician and was given a mouth wash, which he used thoroughly, but the lump grew bigger and pain gradually increased and became severe. Finally he was unable to swallow any solid food, subsisting on liquids only. When he came to the hospital he had an extensive growth involving the tongue, the floor of the mouth, the lower jaw and apparently also the lower lip. An operation was performed and the greater part of the tongue, lower jaw, floor of the mouth, lower lip and also the regional glands in the neck excised. When the specimens were sectioned and examined histologically the tongue showed a typical squamous celled carcinoma and the lip well formed tubercles with typical giant cells, etc., but no evidence of new growth. In one of the regional glands, however, tuberculosis and carcinoma were found to exist side by side, and this I hope to be able to demonstrate with the lantern.

In, 1911 Dr. Oertel reported in the *Journal of Medical Research* a case presenting this combination and also reviewed the literature up to that time. His case was that of a scirrhous carcinoma of the stomach with metastases in the lung, and at autopsy an active tuberculosis of the lung which was invading and destroying the carcinomatous growth was demonstrated. In his review he draws attention to the importance of these lesions and points out the doubtful value of enlarged regional glands in the diagnosis of malignancy, particularly when the glands of the neck are involved. In his summary Dr. Oertel classifies the reported cases under three heads: (1) The cancer may dominate, infiltrate the tuberculous granulation tissues and prevent a successful invasion of the tuberculous infection. (2) The tuberculous inflammation overgrows and destroys the cancer. (3) There exists a close association of the two diseases, "symbiosis", without any applicable destructive influence of one upon the other. To this class our case probably belongs.

The patient eventually died and came to autopsy and the lungs showed a well marked and rather advanced ulcerative tuberculosis.

2. Two cases of tuberculosis of the intestine. The first of these was admitted to Dr. Chipman's service. A female between fifty and fifty-five, whose only complaint was slight colicky pains which had occurred off and on since last April, though lately she noticed a small mass in the right lower quadrant. She saw a physi-

cian and after some unsuccessful treatment was finally sent to the hospital. On physical examination the mass was easily palpable and the colicky pains were practically the only symptom. She was given castor oil and the bowels moved freely. A tentative diagnosis of new growth of the ovary or cæcum was made. A laparotomy was performed and a large mass found involving the cæcum. An entero-enterostomy was done and a small mesenteric gland removed for examination. Both inflammatory condition and new growth were discussed at the time of operation and the latter was rather favoured, but examination of the gland disclosed tuberculosis. This of course favoured but did not prove a granulomatous condition (see above, 1). At a second operation the cæcum was resected and the opinion was then expressed that the lesion was inflammatory and probably tuberculous. This was largely based on the fact that the mucous membrane was intact, while the submucous coats and the musculature were much thickened, firm and leathery. In carcinomata the mucous mebrane is involved with the other coats. This diagnosis proved to be correct as the sections showed characteristic tuberculous granulomatous tissue. The specimen does not show grossly ulceration or tubercle formation but resembles rather closely the condition known as leather-bottle stomach, of which condition five cases were reported by Dr. Armstrong in the "Royal Victoria Hospital Scientific Reports", Series B, No. 1, 1916, under the heading of "Gastritis granulomatosa fibroplastica".

The second specimen of tuberculosis of the intestine is from Dr. Garrow's service. The patient, a Russian pedlar, was admitted complaining of "pain in the abdomen, especially after eating". About four months before admission he had severe cramp-like pains referred to the umbilicus. They occurred eight to ten times in an hour and lasted only about a minute. Once or twice a week he would vomit immediately after eating; this was accompanied by cramp-like pains. He was very constipated, had a cough and once or twice a week had night sweats. Three weeks ago he was seized by a sudden sharp pain which caused him to double up and cry out. During the three weeks he had several of these attacks and finally came to the outdoor of the hospital and was sent into the ward. He then said that he had lost twenty pounds in the past year, had become much weaker during the last three weeks and night sweats had been more frequent. The *x*-ray report indicated distension but no obstruction.

The specimen itself shows a typical tuberculous lesion with

ulceration, fibrous thickening and well marked tubercles, and is interesting on account of its location. As you see it involves more particularly the ileum and only an inch or so of the cæcum. The wall of the distal six inches of the ileum is approximately 1 cm. thick, the lumen relatively large and the mucous membrane necrotic and irregular. This inflammatory thickening extends into the proximal of the cæcum and involves the appendix. The ileum above the thickened part is dilated, the wall thinned and the mucous membrane shows at intervals ulcers which apparently involve Peyer's patches and tend to spread transversely. The serous coat throughout is studded with miliary tubercles.

3. I have here also the organs of the case which Dr. Garrow is presenting to-night. They are from an infant six days old who died following an operation to relieve obstruction. Laparotomy disclosed evidence of perforation and a colostomy was performed. At autopsy a perforation about the size of a five-cent piece was found in the ascending colon near the hepatic flexure. Nothing could be found grossly to indicate the nature of the lesion and microscopic examination does not throw any further light on its etiology.

Dr. Crowdy exhibited slides from all these organs.

Case Report: "Perforation in the large gut in a child of five days," by Dr. A. E. Garrow:

As to the clinical history of the case from which the specimen described by Dr. Crowdy was obtained, it was born last Monday at five o'clock, brought into hospital on Thursday, a period of about sixty-eight hours from birth, with a history that the child had not passed any meconium. As we saw it, it was a rather small, poorly nourished, thin child, with markedly distended abdomen, and crying out every three or four minutes with colicky pain, dropping off to sleep, then crying again; this had been going on ever since it was born. Imperforate anus was suspected but examination showed it to be perforate, with a well developed rectum. I was at loss to decide what the condition was but the indications for immediate relief were great, so the abdomen was opened under a little chloroform anæsthesia and we got a distended small bowel packed with pasty-like meconium, and on opening the peritoneal cavity we got thin, greenish fluid with a few flakes of lymph and bubbles of air. We simply took the largest and most distended knuckle of bowel and drew it out and the specimen will show that this was within four inches of the perforation, but we did not recognize it or think of this as a cause. The child lived forty-eight hours after the operation.

With respect to my other case of intestinal tuberculosis the

prominent feature in this man's condition was the colicky pain of an obstructive character and a history of persistent constipation for several months. This man was a lunger and had been advised at the outdoor department of the hospital to go to the mountains, but he absolutely refused unless he had some relief from his abdominal distress. The disease extended a long way up the ileum and the ulceration involved the Peyer's patches and the solitary follicles also.

PAPER: The paper of the evening was read by Dr. L. M. Lindsay on "Infleuenzal meningitis," with report of case, and was discussed by Dr. H. B. Cushing.

CASE REPORT: Two cases of "Trichinosis from the ingestion of bear meat," by Captain R. O. Ross, M.D., of Stanstead, Que.

DISCUSSION: Dr. W. S. Morrow: I would like to ask Dr. Ross what happens in the case of cure in these cases, whether the trachinæ die, become encysted, or what happens to them, and whether cure is apt to be permanent or not.

Dr. H. B. Cushing: I was interested to hear of these cases because it is rather a coincidence that the first case of trichinosis I saw was in a man living out near Stanstead and the history was that while at a lumber camp he had eaten freely of pork and beans. It is obvious that the bear must have been infected by eating trichinous meat. One interesting point in the case was the occurrence of conjunctivitis. It is usually a marked early symptom in these cases. A number of cases reported in New York were admitted to the eye wards for this condition and the true diagnosis made afterwards. The man I spoke of recovered after some months and has been well since.

Captain R. O. Ross: My belief is that when the human being recovers from trichinosis that the trichinæ do become encysted just as they do in the muscle of the hog. Of course it would be interesting to find out what happens later on. In the case where a portion of the muscle was examined the trichinæ were lying free in many cases in the interspaces between, in other cases they were in the muscular fibres and can very easily be seen by teasing the fibres out. They were coiled and showed very prettily in this form. Where they were between the muscle fibres they were almost straight or could be straightened out. I had heard of the patient mentioned by Dr. Cushing, it having been reported to me after my own cases had been diagnosed. I was also told that for his own satisfaction this man had had one of his muscles incised and a piece examined for the trichinæ, which were readily found.

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The Canadian
Medical Association Journal

Vol. VIII. JUNE, 1918 No. 6

PRESIDENTIAL ADDRESS

ONTARIO MEDICAL ASSOCIATION

MEDICINE AND DEMOCRACY

By John P. Morton, M.B., F.R.C.S. (Edin.), F.A.C.S.

Hamilton, Ont.

EXIGENCIES consequent upon combining five Medical Associations into one great congress and consideration for the scientific programme have led to the suggestion that the President's Address be distributed rather than read at the meeting. My purpose will be to discuss certain problems, actual and prospective, confronting our profession to-day, and, if possible, to suggest solutions therefor.

Permit me to express my deep gratitude to the Association for conferring the Presidency upon me, for I know there are many others more gifted and more deserving of this honour. I have been singularly fortunate in having the advice of men experienced in the work of the Association and a support from our local profession, highly unselfish and praiseworthy.

The thirty-eighth annual meeting is both unique and unprecedented. We have united all the large medical associations of Canada into one great Canadian Congress, to be held in Hamilton during this war year. The desire for this unity and conservation of energy by all the Associations was early noticeable, and following an invitation by the Ontario Medical Association, a conference of representatives from the Canadian Medical Association, Ontario Medical Association, Canadian Public Health Association, Ontario Health Association, and the Association for the Prevention of

Tuberculosis was held at the Academy of Medicine, Toronto, on October 25th, 1917. The spirit of coöperation between the participating associations was very evident and without difficulty, amicable arrangements were easily arrived at for the congress under the auspices of the executive of the Ontario Medical Association. The necessary conferences between such important bodies in anticipation of and in preparation for the meeting in May have been very helpful and augur well for the future organization of our profession, if any action, defensive or constructive, may be contemplated. My deepest concern is that this congress, which is a new departure, and for which I must consider myself partly responsible, will commend itself to the profession from the standpoint of its scientific programme and will engender the spirit of coöperation among the different associations. If these objects are attained, may I express the hope that this precedent may occasionally be followed.

The logic of holding this congress seems so apparent to some of us, that it is almost superfluous to answer some quite honest criticisms to which the proposal has been subjected. Some have said that no meeting at all should be held during such a strenuous war year, but I must conscientiously differ from this opinion for an essential part of war work is to meet and understand the vital questions at home, and our profession at this time, both from the standpoint of its own good and from that of the welfare of the public, is confronted with some strikingly important problems. The report of the Royal Commission on Medical Education has been tabled, and the future of regular medicine in Ontario requires the immediate attention of our Association in shaping and carrying through a resultant government measure. Further, it becomes necessary for us to decide how we can be of use from a purely lay point of view during war times, and this is quite apart from the splendid record of our profession in the work of the Canadian Army Medical Corps. Again, it becomes necessary to consider the pending problems involved in the gradually changing relations between the Medical Profession and the State, for these may result, in the not distant future, in the enactment of a Health Insurance Bill. These are sufficient reasons for the congress, but if any further justification were necessary, it might be found in the fact that we have committed ourselves to a scheme for the reorganization of our profession in Ontario on the basis of the county societies, and it is fundamental to the success of this plan, not only that a meeting be held, but that a large representa-

tion be induced to attend from rural districts. We have been told that separate association meetings would be more stimulating and would benefit the several sections in which they were convened, but surely the great need for conservation of time and energy is a satisfying answer to this criticism.

Permit me, with pride, in the early part of this address, to indicate the increasingly onerous part taken by the medical profession in the great world war. The Ontario profession has been greatly honoured and grandly represented by about twenty per cent. of its members who have joined the Canadian Army Medical Corps, and we are very proud of those who, at great personal sacrifice to themselves, have crossed the ocean to accept whatever appointment might fall to their lot, and in many cases to risk their lives for their country. Above all, will we enshrine in memory our heroes who have given their lives at the call of duty for the defence of country and liberty, and as Sir Berkley Moyinhan has so well said: "Let us write the epitaph they would most desire—'they have played the game'," than which there is no higher meed of praise. The awful necessities of this terrible struggle exhibit human nature at its best, and, unfortunately at its worst, for our Old World has never witnessed a sadder paradox than this, that the greatest scientific geniuses are seen planning human destruction and then passing on the wrecks they have made for reconstruction to geniuses just as great. Happily for our profession, this work of reconstruction largely falls to our lot, and our only desire is that it shall be well and faithfully performed.

If this meeting of the Ontario Medical Association typifies any special idea, it is reorganization. For long, the progressives among us have recognized that unity has been sorely needed between the many medical clubs, societies and associations of Ontario. Uniformity of purpose and desire have undoubtedly been in evidence, but an absolute lack of organization for the attainment of these objects has been still more in evidence. At the Toronto Association meeting not more than an odd hundred would register from the remainder of the province. When the weight of a united profession was required to exercise its justificable influence on the authorities concerned with framing a medical bill which would decide the standing of our profession for years to come and define the protection that the public might legally expect from exploitation by charlatans, those interested found the necessary initiative woefully absent and could discover no means whereby the medical

voice of the province, though unanimous, could assert itself. Our own Association which should have, and did finally move in this matter, represented only four or five hundred of the three thousand practitioners. In marked contrast to our criminal want of organization, the irregulars, in their presentation of evidence before the Commission, fought as one man and employed the most effective legal talent. Our negligence, where the medical welfare of the public is so vitally concerned, is unjustifiable and for years much medical charlatanism has been made possible, because years ago, when this question was originally dealt with by our Legislature, the same spirit of professional lethargy was abroad. These facts and many others have spelled lack of efficiency and have rendered absolutely necessary a radical change in organization. A carefully selected committee has drawn up a new constitution and by-laws; these were adopted by our Association at a representative meeting on October 25th last, and our gathering this year is notable as being the first held under the new regulations. We confidently expect, by these regulations, to be enabled, in a more comprehensive and effective manner, to serve the public and the State. In this departure our committee has wisely accepted the successful precedent of the Americal Medical Association. The guiding principle of the new constitution is to render the province a unit by adequate organization, and this is well accomplished by giving the county societies proportional representation on a Committee of General Purposes which will be the governing body of the Ontario Association. The ethical standards also rest with the local bodies, for only their members in good standing may join our Association. Democracy is thus applied to the organization of the medical profession, for the parent provincial association now really voices the medical opinion of the province, as our registration contains theoretically every doctor in the province. To render this representation vital and actual, each local society must be active and speak authoritatively for its own district. To bring about this desirable state I would suggest that we again follow the example of the American Medical Association and appoint councillors, who, in groups of possibly three, might be placed as advisors for and supervisors over the societies in certain territories, helping to arrange meetings and to make available good material for programmes. Moreover, they would assist in establishing societies in unorganized parts and would be required to report to the Association for their respective districts. To the extent that local societies are not representative and that localities are unorganized, or, if

organized, are inactive, to this extent does our Association under its new constitution, fall short of its ideal. I am speaking to the question for Ontario, yet it is devoutly to be desired that this plan for reconstruction be applied to the whole Dominion. Contemplate for a moment the splendid position of our Canadian profession realizable by the consummation of this scheme. Every district would have an active local society, and these bodies, through proportional representation, would control their respective provincial associations which they would unite to form. These provincial associations, in their turn, would unite to constitute and control the Canadian Medical Association. This complete system, already partly in operation, would reflect the democratic spirit of the times and would function defensively and constructively for the highest good of the profession and the public. We would secure much greater concentration of influence more unity and definiteness of purpose, better uniformity in our ethical and educational standards, a marked improvement in coöperation between our local societies and associations, and increased attendance at our meetings. Our Association is deeply indebted to those of our members who have not only dreamed of this new order of things, but have been instrumental in its realization.

The Royal Commission on Medical Education, after numerous sessions, at which every opportunity for giving evidence was afforded, has printed its findings, and, although we purpose to argue in committee many points which seem unsatisfactory, we have, on the whole, reason to be pleased with the report. The commission recommend that the care of the sick be in the hands of the medical profession, and that any one to whom the province gives this important privilege, must have at his disposal the available knowledge on all subjects pertaining thereto. Certainly the only manner in which we can effectively answer and counter the claims of the irregulars is to incorporate in our own teaching system all the therapeutic measures which have proven themselves beneficial. The report insists that we have been somewhat prejudiced and that physico-therapeutics must form a more prominent part of our teaching, and that an adequate staff and apparatus be provided for this purpose. Someone has said that "Convictions are more dangerous to truth than lies", and we have probably been too sure that our system has covered the whole field of treatment. The history of the wonderful changes in thereapeutics from Hippocrates to these times persuades us to keep our minds open for suggestions from whatever source. William Harvey's first publi-

cation, "Motions of Heart and Blood", was unable to pass medical censorship for twenty years after it was written. Renouard says that medical men of his day considered Harvey demented and that he lost most of his practice, in spite of the clearness and method with which he developed his ideas. Lord Lister's fight, extending over years, for the recognition of the principles of antisepsis, is still more impressive. Without contradiction one may say that prejudice, doubt, and active opposition have been the outstanding characteristics of the fate of really valuable new medical truths. Next to the antagonism of the Church, probably our own prejudices and conservatism have been the worst barriers to progress. The Royal Commission was right in this criticism, and it behooves us for our own welfare and the welfare of those in our charge, to keep minds open for the consideration of even apparently heterodox treatment. Our teaching bodies should be especially alert, and might include a progressive medical committee for the testing of even accidentally suggested therapeutical methods. Next winter a bill, based on this report of the Royal Commission, will come before the Legislature, and because our cause is just and we are in a position properly to present it, we are hopeful that the measure in its final form will do our profession full justice. Certainly it would be unworthy of us to gain control over the health of the community by organization, lobbying or other political device, unless we conscientiously strive to maintain the highest possible standard of efficiency.

I feel called upon in this address to introduce certain other considerations which seem to me of vital importance for the welfare of our profession and of the public whom we serve. "Service" is the best and most significant word in the English language today. Consideration for others is certainly the avowed ideal of sane modern democracy. The stupendous world conflict, in which at this moment great armies are advancing and recoiling, with the result wavering in the balance, will decide whether the German point of view is to stand or fall, that might is right and that the weak have only the privilege of servitude. The application of this saving principle of service to our profession raises the question whether in simply caring for the sick we are fulfilling our whole duty to the public. From my view point, our medical associations, societies, clubs, and round tables should not be for self-betterment alone but should actively engage in the great service of medically educating the laity. No government cares to enact laws without the support of public opinion, and it is equally desirable that we

should secure effective lay coöperation by education before seeking general support for the many great public health movements. Our health officers may enact all manner of legislation, but, until the public wittingly coöperates, these will largely fail to obtain the desired prevention. If then our organized profession is to live the larger life of service, it must use its organizations for public education. But my appeal is also to the individual physician to expand his sphere of usefulness by using his wonderful opportunities to inculcate the accepted principles of prevention and cure of disease. Few of us now act on the old-fashioned notion that the doctor should like the Asclepiadæ in the old mystical days of healing, surround himself with an atmosphere of mystery, which too often is but the cloak of ignorance. You will not interpret this to mean that the patient should be fully informed of his disease, but there is no reason why the physician should not be a medical missionary of education, and thus fulfil the modern democratic principle that we should think in terms of our neighbour. The greatest service then that our organized profession and the individual physician can render the public is to educate them medically to a reasonable extent. This would strengthen the hands of our public health officers, for enlightened public opinion in such problems as the venereal diseases and tuberculosis would help and force our legislators to keep pace with it; we ourselves would be stimulated to maintain higher standards both in teaching and in ethics, and further, the public generally would not so easily become the dupes of charlatans, who would then be rated at their true value.

Another consideration to which I would invite your attention may be put in the form of a question. Do we as a profession, in the great responsibility entrusted to us, adopt adequate means for safeguarding the public from incompetency among ourselves? Do our recent graduates possess the very highest possible standard of theoretical education and the practical knowledge necessary to treat and operate for disease? In too many cases, I fear, they acquire at the expense of their private patients, their practical knowledge, which should have been gained in some hospital. This might be prevented by greater teaching efficiency and by improving the facilities for clinical and practical instruction. Full time professors in at least medicine and surgery are essential. Again, after a man has been in practice for a number of years and makes no attempt to keep in touch with modern ideas, he becomes educationally mired and is a medical menace in his community. Un-

fortunately this type of doctor often learns ways of beguiling the public as fast as he unlearns his medicine. Can the public be protected from this danger? Some have suggested that we all undergo periodical examinations to be conducted by the whole-time men at the teaching centres. Even classification of practitioners, perhaps every seven years, has been mentioned as a help. A more practical expedient would be to require each one to undertake post-graduate work at specified times, and proper facilities for this would then be obligatory upon all university and hospital centres. Moreover, all teaching bodies might be able, through local societies, to provide courses of extension lectures.

This seems a suitable juncture to mention the very commendable propaganda on the part of the American College of Surgeons for standardization of hospitals on the basis of efficiency. Taking into consideration the various conditions under which hospitals operate, certain requirements would be laid down, and according to the degree to which these requirements are fulfilled, would the hospitals be classified. The factors named as imperatively essential are, the keeping of good case records and the utilization of these records as tests of efficiency; the maintenance of proper laboratory facilities; and the presence of a staff with good character. In the Bulletin issued in March of this year by the college, these three requirements of a minimum hospital standard are stated as follows:—

Case Records. That the hospital keep in a systematic manner case records of its patients together with a convenient summary of each case; and that it utilize these records in analyses of its medical and surgical efficiency.

Clinical Laboratories. That as implied in the foregoing requirements concerning case records, the hospital provide either directly or indirectly, the laboratory facilities, which in the science of medicine are essential in the diagnosis and treatment of patients admitted for care under normal conditions.

Division of Fees. That the hospital trustees or governing authorities in coöperation with the staff take action definitely to prohibit from all services of the hospital the practice of division of fees.

Although these considerations are accepted by the committee as a minimum for testing hospital efficiency, the various hospital staffs are requested to consider other features of the work, which, in their judgement should become part of the standardization programme. These are: The training of internes, the training of

nurses, obstetrics, pediatrics, cross infections, diatetics, anæsthesia, intelligible financial accounting, hospital administration, and pharmacy.

To safeguard the welfare of the public then, the highest standard of hospital efficiency is necessary, for the people now look upon this service no longer as a luxury but as an inherent right. The regents of the American College believe that a proper accounting in hospital work is inevitable, and that if the initiative is not taken by the profession, it will, as has been done in some case already, be taken by the public. The better to safeguard the public from inefficiency among ourselves, I would add the following requirement to the criteria of efficiency noted by the Regents, viz.: That all hospitals be properly equipped for post-graduate studies.

Among prospective problems may be placed the future relation of the medical profession to the State, which is claiming more and more attention in all countries. We are experiencing great democratic changes and are informed that still greater upheavals will occur after the war. Our profession may soon be required to formulate some plan where by the poorer and more medically neglected sections of the population will have the right and privilege to ask for free medical or surgical care. The cost of this so-called health insurance system would be divided between the patient, the firm, and the government. Hospitals and other properly equipped diagnostic centres would be established, where all necessary examinations for arriving at correct diagnosis would be carried out. The greatest gain of this plan would be the abolition of charity work, the very name of which has a stigma attached to it. Gladstone has said that we must do away with all charity, for we are sorry when we dole it out and we are sorry when we withhold it. Patients under this scheme would feel entitled to a physician, to a nurse and to the necessary medicaments. Of hardly less benefit would be the wonderful opportunities offered for scientific social work, for the presence of trained nurses in any of these homes would be a wonderful educational factor in cleanliness, and, let us hope, in godliness. Medical assistance would undoubtedly be called earlier with a consequent prevention of much disease and curtailment of many epidemics. There would be required some system of referees to assure efficiency and to prevent men lowering themselves to lodge practice methods by abuse of the system. The experience of all the other countries which have tried this plan of health insurance should enable us to evolve a very satisfactory act. Whatever the future may hold for us in this regard, thanks

to the reorganization of the profession, we are not likely to have a measure of this character enacted without thorough consideration by the medical men whom it most concerns. The medical profession can be proud of its record through many centuries, and it is to-day the only one which offers its services without cost to thousands in every city in the world. Now, although this is highly unselfish, and although we have been thoroughly conscientious in the performance of this work, it is justifiable to inquire, if, in the light of modern social service investigation, we are wise to continue this form of charity. Carried to the excess which is necessary in looking after the great dependent sections of our communities, it leads to a sense of superiority on the part of the donors and to a reprehensible pauperism of the recipients. Our social service scientists tell us that in so acting we are dealing with the evil from the wrong standpoint. Rather should we cooperate with the laity in initiating and furthering all movements which will tend to prevent disease. We are advised to be foremost in working for all child welfare organizations, for propaganda against venereal diseases and tuberculosis, for all public health work and other educative schemes. Our heartiest support should be tendered to all properly organized community centres and playgrounds, and in a word for all social service enterprises. These preventive organizations would make unnecessary a large part of our present charity work for the poor. If a good Health Insurance Act were in force, the poorer classes would be provided for medically without charity, and the self-sacrificing spirit, so proverbial of our profession, would be much more effectively exhibited in the ways above noted.

In bringing this address to a conclusion, permit me to express the same hope as did my immediate predecessor that before this Association again convenes, the awful world-convulsing war will be finished and that the principles of liberty and democracy will have triumphed. Just as in the individual, evil and good strive for the supremacy, so in the world as a whole, fearful conflicts seem necessary to assure that steady progress of ideas in which our faith for the future lies. In our private business and national life, heart-searching is required, for there is much of that very might-is-right spirit, typified by our foes, to defeat which we are pledging our property and our lives. It is gratifying to know that in the work of reconstruction which this war makes necessary, the medical profession must take a large and noble part, for whatever change there be in the spirit of the age, it cannot sound a more inspiring watchword than ours—SERVICE.

THE DETERMINATION OF BASAL METABOLISM BY THE "RESPIRATORY-VALVE AND SPIROMETER METHOD" OF INDIRECT CALORIMETRY, WITH AN OBSERVATION ON A CASE OF POLYCYTHEMIA WITH SPLENOMEGALY*

By Maude E. Abbott, B.A., M.D.

McGill University, Montreal

(*Published under a grant from the Cooper Fund for Medical Research*)

I. Introductory

THE *Science of Calorimetry.* Probably no single departure in medical science has been so productive of significant results in the establishment of definite biological standards, and in the yielding of exact clinical data upon the metabolic life processes of the individual, as has that chapter of observations which began with the measurement of the respiratory exchange by Regnault and Rieset in 1850 and the computation of heat production by Pettenkofer and Voit in 1862, and the invention of the respiration calorimeter by Rubner in 1894, and which culminated, through the skill and genius of Atwater[1], Rosa[2], and Benedict[3], in the perfected respiration chamber calorimeter, as installed and operated to-day by trained corps of workers at the Russell Sage Institute of Pathology in New York, and the Nutrition Laboratory in Boston. Through the numerous studies made by trained workers upon these calorimeters and other forms of respiratory apparatus—foremost among which must be enumerated the elaborate series of determinations by Benedict[4], Carpenter[5], Lusk[6] and Collaborators, under the titles "Animal Calorimetry" in the *Journal of Biological Chemistry*, 1912–1915, and "Clinical Calorimetry" in the *Archives*

Presented before the meeting of the Canadian Medical Association, June 15th, 1917, and received for publication, May 4, 1918

*From the Clinical Laboratories of the Royal Victoria Hospital, Montreal.

of Internal Medicine for 1915–1917, and also in the various publications issued on this subject by the Carnegie Institution from 1907 to 1915—abridged computations have been tabulated, curves plotted and normal standards established, so that the complex calculations involved in this work, and the extensive preliminary data required for accuracy in it, are being rapidly reduced to their simplest terms. The same set of workers again, with whom must be included Boothby and Peabody, Eugène and Delafield Du Bois, Means, Higgins, Henderson and others, and, in a less technical but very vital sense, Joslin, Allen and Edsall, have, by determining the metabolism in various pathological states, established the clinical significance of altered heat values especially in those obscure conditions of disordered internal secretions and blood or tissue regeneration, the recognition of which was so well described by the late Dr. Theodore Janeway[7], in his brilliant Address before this Association, as one of the main functions of the modern consultant.

Finally, the various forms of apparatus in use to-day for the determination of respiratory exchange and heat production, from the complicated Atwater-Rosa calorimeter down to the simple Tissot spirometer and Douglas bag, have been subjected in all their details to an exhaustive comparative study by Dr. Carpenter[5], which has been published with full descriptions and diagrams by the Carnegie Institution of Washington. Thus, in very recent times, the science of calorimetry, that is, the calculation of the heat production of the individual, has been reduced from an abstract physical science to a practical subject within the grasp of the ordinary student of medicine, and, by an admirable coöperation of workers and resources, has been brought within the range of easy clinical application in any hospital of modern staff and equipment. These results of the combination of executive genius, unselfish scientific work, organized hospital and laboratory resources, and beneficent legislative support, which underlies the present status of the subject of respiratory metabolism in this country, is surely a triumph of which twentieth-century medicine may well be proud.

Definitions. *Basal Metabolism* is the term applied to the heat production of an individual in the fasting and resting state, and may be estimated in a given case by the calculation of the total calories produced per hour, and per square metre of his body surface area. It is usually expressed in terms of per centage of the basal metabolism of normal individuals of the same age and sex, quantities

which have been established through the series of determinations on normal subjects made at the Russell Sage Institute of Pathology, and elsewhere.

The determination of the heat production of an individual is known as the *Science of Calorimetry*. It may be carried out by two methods, termed respectively, direct and indirect. By *Direct Calorimetry* is meant the estimation of heat *elimination*, that is, the heat given off by radiation, conduction, and vaporization, as directly observed and estimated during the time the subject is confined in a closed air chamber, known as the respiration calorimeter. *Indirect Calorimetry* is the determination of the *heat production*, and may be expressed by the ratio of the carbon dioxide and oxygen given off during a given time in a known volume of air to each other, and to the height-weight curve or surface area. This indirect method may be carried out in one of two different ways, the so-called "closed circuit" and "open circuit" methods.

In the *closed circuit* method of indirect calorimetry the expired air is conducted from the patient directly through bottles containing soda-lime and sulphuric acid of known weight which deprive it of its carbon dioxide and water respectively, while the oxygen needed for absorption is introduced from a weighed container; the amount lost of carbon dioxide and water are determined by weighing the receivers before and after the experiment, and the oxygen introduced is computed by weighing in the same way. This is the method followed in the Benedict apparatus, and the Atwater-Rosa calorimeter at the Russell Sage Institute is supplied with a similar equipment, so that with it both direct and indirect methods of calorimetry are carried out on the same patient and are used to check each other in the routine investigations carried on.

In the *open circuit* method of indirect calorimetry the expiration of the subject is not analyzed in the apparatus, but he breathes in and out of tubes separated from each other by expiratory and inspiratory valves, from which latter the expired air is measured in a tank meter or bag for subsequent gas analysis. This method is that followed in the Zuntz-Geppert apparatus, the Tissot spirometer, the "respiratory-valve and spirometer" method described and figured here, and the Douglas bag.

II. The "Respiratory-Valve and Spirometer" Method of Indirect Calorimetry

As stated, this is an open circuit method, similar in principle and apparatus to that of the Tissot spirometer, which is described and figured in the monograph by Carpenter[5] (p. 64). In it the patient is connected by tubes provided with expiratory and inspiratory valves with a spirometer tank in which a known volume of his expired air is collected during the experiment, from which samples are withdrawn and analyzed on the Haldane gas analysis apparatus for their percentage content of oxygen and carbon dioxide, the ratio of these gases to each other and to the volume of expired air breathed into the tank during a given time at a standard temperature and pressure, furnishing the data for computing the patient's heat production.

While not intended to replace the calorimeter chamber, which, as a means of direct computation and for the final checking of standards cannot be dispensed with, this method has a very wide range of usefulness. The apparatus is simple and relatively inexpensive, and the method is one of easy application to the patient, and requires a much shorter time of attachment than the stay demanded in the respiration calorimeter, while the results obtained in the hands of reliable technicians are found to be practically identical with those by direct calorimetry. In his comparative study of the methods of investigating respiratory exchange, Dr. Carpenter gives the Tissot prominence as being both reliable, and valuable from its simplicity and easy application. His recommendation of it is emphasized by Yandell Henderson[8] in a recent communication.

The respiratory-valve and spirometer method (of which the Tissot is the best-known example, and of which it may be taken as the type) was that followed by Dr. Walter M. Boothby at the Respiration Laboratory of the Peter Bent Brigham Hospital, and is that now conducted in his laboratories at the Mayo clinic. During the winter of 1915–1916 it was the privilege of the writer to spend a month at the Brigham Hospital Laboratory under the kind tutelage of Dr. Boothby and his able assistant and associate, Miss Irene Sandiford, with the result that the following summer a spirometer was installed at the Royal Victoria Hospital, Montreal, and the work initiated here under their personal instruction, and through the support of a grant from the James Cooper Fund for Medical Research. A full description of the technique of the

"respiratory-valve and spirometer" method as carried on by Dr. Boothby and others in this country, and of the modifications introduced at his suggestion on the spirometer figured here, should be of interest, and is one of the objects of this communication. In this connexion, I would especially acknowledge to him and Miss Sandiford the abridged calculation sheet which is published later in this communication.

Description of Apparatus. The original Tissot spirometer[9], (designed in France) differs somewhat in construction from the modification figured in this article, and is supplied with an automatic water siphon counterpoise, and special (Thiry) valves and glass nose pieces. The principle is, however, identical, the changes introduced being simply those indicated by convenience, economy, or greater simplicity. The construction of the apparatus in use here will be readily understood from an examination of the diagram of it (Fig. 1) kindly made for me by Dr. Louis Gross. In it the spirometer bell or tank, which is here of a capacity of about 200 litres, is made of aluminum (in this spirometer), or of copper, preferably the latter, and must of course be absolutely air-tight. It is inverted upon and received into an ordinary galvanized iron ash barrel (A), which is filled to within about eight inches of its brim with water, upon which the spirometer floats, and into which it sinks by its own weight when deprived of counterpoise. The spirometer is attached to a lead counterpoise (G), which holds it in equilibrium, by a steel measuring tape (B), graduated to 200 cm., which passes over a steel balance wheel (D), so placed that its outer circumference stands directly over the centre of the spirometer, over the surface of which the tape must run smoothly with a minimum of friction. Air is admitted into, and discharged from the barrel through two one-inch iron pipes which pass vertically downwards on either side along the outer wall of the receiver (A) to near its bottom where they are bent inwards piercing its sides, and passing along its floor to near its middle are turned sharply at right angles to pass vertically upwards to a point about two inches above the level of the water which it contains, thus communicating with the cavity of the spirometer. The external openings of these pipes are supplied with ordinary three-way gas-plumbing stop-cocks, the surfaces of which are well ground and greased so that they turn readily and can be opened and closed with a key instantaneously, at the beginning and end of an experiment, and which are provided with stops preventing them from turning beyond the three direc-

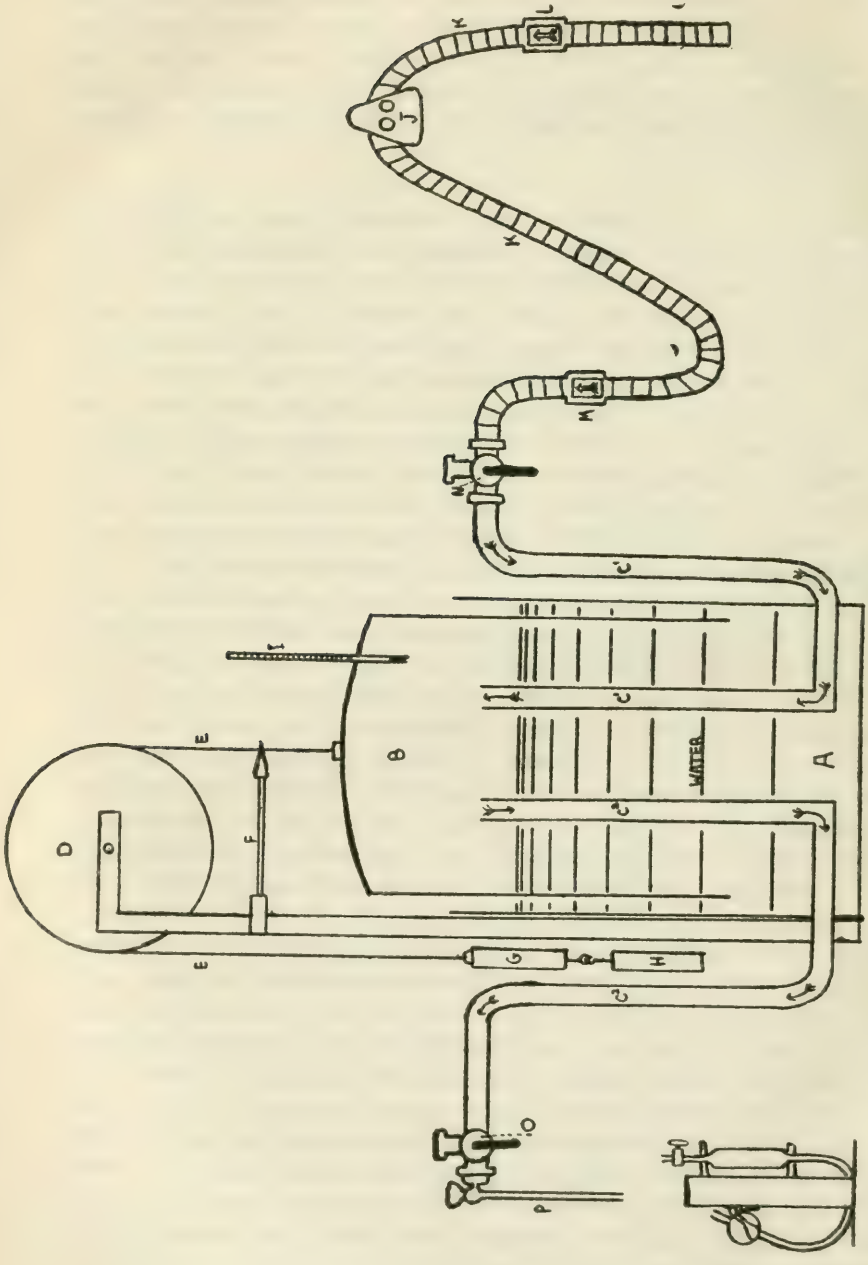

FIG. 1.—VERTICAL SECTION THROUGH RESPIRATORY VALVE AND SPIROMETER APPARATUS (MODIFICATION OF DR. WALTER M. BOOTHBY)

Fig. 1—Key to lettering of illustration showing Vertical Section through Respiratory Valve and Spirometer Apparatus

A. Galvanized iron vat, three-fourths filled with water, on which the bell of the spirometer floats, and which acts as a seal.

B. Bell of the spirometer tank made of copper or aluminum in which the expired air is collected for measurement and analysis.

C^1 C^2 Iron pipes passing from without up through the floor of tank to a point above the level of the water, and permitting the passage of air in[1] and out[2] of the spirometer.

D. Balance wheel for suspension of spirometer bell by

E. Steel tape graduated in centimeters for measurement of volume of expired air collected (i.e. height to which spirometer ascends).

F. Indicator needle for reading height of spirometer before and after experiment

G. Lead counterpoise, so adjusted as to maintain tank in equilibrium at about two-thirds of its height.

H. Additional weight added during experiment to allow tank to rise gently with each expiration (by negative pressure).

I. Thermometer for ascertaining temperature of expired air at close of experiment.

J. Mask applied to patient's face during experiment. The two holes admit the entrance and permit the exit, respectively, of the inspired and expired air.

K. Corrugated flexible rubber tubing passing from either side of the mask and connecting it with

L. An inspiratory valve, communicating with the outer air and

M. An expiratory valve, attached to the flexible tubing, and to iron pipe leading into spirometer through

N. Three-way valve which connects the inlet pipe C^2 of spirometer (a) with the patient, or (b) with the outside air, or which (c) closes the spirometer to both.

O. Three-way valve which connects the outlet pipe C^2 of the spirometer (a) with the outer air (as in emptying the spirometer), (b) with gas sampling tubes for withdrawal of samples, or (c) closes spirometer to both.

P. Gas-sampling tap. A small stopcock with rubber tubing attached, inserted into one outlet of the three-way tap N.

Q. Burette with gas-sampling tubes into which samples of expired air are withdrawn through the stopcock P, at close of experiment for subsequent analysis.

tions desired. The valve (N), at the entrance pipe connects it with the flexible tubing carrying the expired air from the subject into the spirometer, and may be opened (*a*) to the patient and the spirometer, (*b*) to the spirometer and outer air, but closed to the patient, and (*c*) may be closed to the spirometer. The valve (O), at the exit pipe is blocked in one of its openings by a small stop-cock (P), through which air may be withdrawn from the spirometer at the close of the experiment to the gas sampling tubes. The exit valve may thus be (*a*) open to this gas sampling tap and the spirometer, (*b*) open to the spirometer and the outer air, or (*c*) closed to the spirometer.

The apparatus for the transmission of the expired air from the patient to the spirometer used here (see Fig. 2) is a mask obtained from the H. N. Elmer Co., 1140 Monadnock Block, Chicago (agents for the Siebe, Gorman Co.), and figured at page sixteen of their catalogue. To it are attached rings for the attachment of tapes to tie it over the patient's nose and mouth. The flexible corrugated rubber tubing (K) passing from the mask to spirometer may also be obtained from the same source. It may be replaced by ordinary hose tubing if desired (as in this spirometer) except near the mask, and at the bend for the expiratory valve, where the flexible tubing should be used. The inspiratory and expiratory valves used in the course of the tubing from the patient are in this apparatus the ordinary Douglas' valve, in which a back current of air is prevented by a mica flap. They do not respond so readily to changes in the direction of air as the Tissot valves and so have not so high a percentage of efficiency (Carpenter), but give sufficiently constant results for use. *During the experiment they must be fixed in the vertical position, with the mica flap horizontal.* The inspiratory valve should not be placed at the end of the intake tube, but separated from the outer air by a short length.

The counterpoise (G) used in this apparatus is an ordinary piece of lead tubing closed below and filled with shot to such a weight that when it is in position, with the spirometer valves open, the tank will stand at equilibrium at about half of its height. On its bottom is a hook for the attachment of the additional weight (H) which must be such as to allow the tank to rise gently with each expiration.

The subject of the counterpoise to be used, and of the additional weight to be added during the experiment is of interest. In the original Tissot, and in several laboratories in this country, a constant equilibrium of the tank at all points of its height is

maintained by means of a water siphon balance, but it has been shown by Dr. Carpenter[5] (p. 217) that such an automatic arrangement is unnecessary, and that trifling changes in the counterpoise do not signify.*†

The additional weight to be added during the experiment varies slightly with different apparatuses. It must be sufficient to allow the tank to rise gently with each expiration but not enough to send it up without this. In this spirometer it is 200–250 gms.

Description of technique. The preliminary essential for basal metabolism is that the patient must be in the *fasting* and the *resting* state. The experiment is therefore preferably conducted in the early morning, and directions are given in the ward that no nourishment is to be taken after six o'clock the previous night except a cup of *Kaffee-hag* or tea at 7.00 a.m. if desired. A new patient should be visited in the ward the previous day by the operator and the procedure explained and all anxiety removed. At 8.00 a.m. he is sent to the laboratory in a bed with three pillows, accompanied by a nurse who remains with him throughout the experiment, and is trained to make certain necessary observations. From the moment he enters the laboratory absolute quiet is essential, the door being closed and no conversation above a low tone permitted (for the psychological as well as actual effect).

The observation is divided into the preliminary period and the experiment proper, which is run in two periods of eight to fifteen minutes according to the character of the case. In the *preliminary period* the patient must lie at complete rest in a comfortable position without speaking, during which time his temperature and full minute pulse and respiration are taken and charted by the nurse, as also his blood pressure and a pneumograph tracing if desired, the operator meantime emptying the spirometer of air and placing

* The writer made several observations upon various weights of counterpoise before seeing Dr. Carpenter's article with confirmatory results.

† As a result of an enquiry made of Dr. Carpenter through Dr. Paul Roth upon the subject of the adjustment of the weight of the counterpoise, I received the following reply:

"Dr. Carpenter tells me that he balances the spirometer as perfectly as possible with the bell half-way up (or down). To check it up he adds *for instance* 40 grammes on the bell to cause it to sink slowly and down to the bottom. He returns the bell to the *half-way* position and puts the 40 grammes on the counter weight this time. If perfectly balanced the *smallest weight* which will cause the bell to sink to the bottom *from the half-way position* will also, when transferred to the counter weight, cause the bell to rise just to the top. If, for instance, the weight will sink the bell but will not raise it proportionally when transferred to the counter weight, it indicates that this counter weight is yet too small."

all in readiness for the experiment. Towards the close of the preliminary period the mask is applied to the patient's face and tied firmly in place by the tapes attached, two additional tapes being added around the head and over the mask to keep it tightly adjusted without the slightest leak (which may be tested for by applying soap bubbles). Care must be taken that the patient is perfectly comfortable and that his respiration is quite unimpeded, the slightest obstruction leading to erroneous rises in the metabolism figures. The tank is then "washed" several times with the patient's air by admitting and discharging a small quantity through the entry and exit valves. After the last washing a cushion of the patient's air is left in the spirometer and both valves are closed, the counterpoise is attached, and height of spirometer read.

To begin the first period of the experiment, the operator adds the additional weight to the counterpoise and immediately connects the patient with the spirometer by suddenly opening the entry valve, preferably at the end of an expiration, and at the same moment starting the stop-watch. The spirometer should rise very slightly with each expiration and should be allowed to ascend to about two-thirds or three-fourths of its height as desired. Meantime the operator records the time of starting, and the nurse records the full minute pulse, and half minute respiration every two minutes, and notes any changes in the patient's condition or breathing on a chart which becomes part of the record. The period is closed by simultaneously closing the entry valve and stopping the stop-watch, removing the additional weight, and taking readings of the height to which the spirometer has ascended, the temperature of thermometer, the duration of period by stop-watch and the barometric pressure, and recording these data on the calculation sheet. The difference in the height of the spirometer at the start and finish is the rise of the spirometer due to the air expired in the time shown by the stop-watch. The patient is now released from the mask and samples are taken. This is done by first allowing a portion of the air in the spirometer to escape through the exit valve (the counterpoise being removed, so that the tank will sink by its own weight), in order that the central part of the contained air may be obtained for the samples, and then drawing off duplicate samples through the small gas sampling tap (which must be first "rinsed" with the patient's air for some minutes). The barometer is read and recorded at the close of each period. After the end of the second period the patient is returned to the ward, where his absolute weight and height are taken and checked by a second observer (as

Fig. 2.—"Respiratory-Valve and Spirometer" Apparatus for Determination of Basal Metabolism as in use at the Royal Victoria Hospital, Montreal.—(Technique of Dr. Walter M. Boothby, applied by M. E. Abbott).

The picture is taken as in the middle of a period, except that the additional weight has been removed from the counterpoise. The mask is seen attached to the face of the patient, with the nurse seated as during the experiment, and the spirometer has risen to half its height. The flexible corrugated rubber tubing attached to the mask, and the entry and exit valves of the spirometer, are obvious details of interest. Photograph by Mr. H. H Wootton, of the Royal Victoria Hospital.)

are all readings) and recorded. The samples obtained are analyzed in duplicate by the Haldane apparatus for the CO_2 and O_2 percentage, all figures used being retained on the sheets.

The Calculations. As may be gathered from the above description of the technique, the following data have been obtained from the experiment for the calculation of heat values and basal metabolism: (*a*) The volume of air in the spirometer; (*b*) the time in which this volume was expired; (*c*) the temperature of the expired air in the spirometer; (*d*) the barometric pressure (which is required in order that all calculations may be reduced to standard pressure for comparison with each other); (*e*) the percentage of oxygen absorbed, and carbon dioxide exhaled; (*f*) the height and weight of the patient; (*g*) the age and sex of the patient, whereby he may be compared with the normal.

From these data it is required to calculate (*a*) the volume per minute; (*b*) the CO_2 per kilogramme per minute; (*c*) the oxygen per kilogramme per minute (*d*) the ratio of carbon dioxide exhaled to oxygen absorbed, *i.e.*, the respiratory quotient; (*e*) the calories per square metre per hour (*i.e.*, the basal metabolism); (*f*) the basal metabolism in terms of percentage of the normal standard for the sex and age of the patient.

ROYAL VICTORIA HOSPITAL

CALCULATION SHEET FOR RESPIRATORY METABOLISM*

Case No. . . 24405		Temp. . . . . 98° F.	Date, Dec. 13th, 1916.
Name. . . . . Thos. Dougall.		Height. . . . . 163·1 cm.	
Age. 58		Weight. . . . . 43·73 kg.	Period. . . . . II.
Diagnosis. . Polycythemia and Splenomegaly.		Surface Area. 1·42 sq. m.	

Barometer.	750·3 mm.	(*a*) Log Fact. spir.	·1652
Temp. Spir.	14·5° C.	" Spir. diff.	·5775
		" Fact. S.T.P.D. . . .	·9629
Spir. Start.	55·65 cm.	"	
End.	17·85 cm.	" Total vent.	·7056
		" Time.	·9122
Diff.	37·80 cm.		
		" Vent. per min. . . .	·7934 = 62·1.

* This sheet is a copy of the printed form for calculations on respiratory exchange constructed by Dr. Boothby and Miss Sandiford for use in the laboratory of the Peter Bent Brigham Hospital and Mayo Clinic, and by their kind permission introduced at this hospital also.—(M. E. A.)

Time Start	9.40 a.m.	(c)	
Duration	8m.10s. = 8.17 min.	O_2 Inspired, corr.	20·98%
(b)		" Expired	17·57%
CO_2 Expired	3·14%	" Absorbed	3·51%
" Inspired	0·03%		
" Produced	3·11%	Log O_2 absorbed	·5453
		" Vol. per min.	·7934
Log CO_2 produced	·4928	" O_2 per min.	·3387 = 218 cc.
" Vol. per min.	·7934	" Weight	·6405
" CO_2 per min.	·2862 = 193 cc.	" O_2 per kg. min.	·6982 = 4·99 cc.
" Weight	·6405	(e)	
" CO_2 per kg. min.	·6457 = 4·42 cc.	Log O_2 per min.	·3385
" O_2 per kg. min.	·6982	" Cal. value O.	·6913
(d)		" 60 min	7782
Log Resp. Quot.	·9475 = .89	" Total. Cal. per hr.	·8080 = 64·5 Cal.
Normal Comp.	35·2 Cal.	" Surface Area	·1523
Metabolism	+28·7 %	" Cal. per sq. m. hr.	·6557 = 45·3 Cal.

Notes:—Samples from Period II. only analyzed.

Analyses.

Sample No. I.		Sample No. II.			
9·176		9.153		Avg. CO_2	3·14%
9·175		9.154		" O_2	17·57%
				$CO_2 + O_2$	20·71%
8.887		8·868			
8.886 = ·289 = 3·10%		8·868 = 1286 = 3·13%			
7278		7263			
7277—1·609 = 17·53%		7260 = 1·608 = 17·61%			
					Readings by M. E. A.
4609	2066	4564	2063		Checked by H. M.
9628	9628	9614	9614		Analyses by M. E. A.
4921	2438	4950	2449		Calculations by M. E. A. Checked by H. M.

These calculations are carried out by four-place logarithms[10] where multiplication or division is required. They are further simplified by a number of computations made in tabular form by various workers, and which can be obtained by those interested. In the last two items (*e* and *f*) the calories per square metre are calculated from the body surface-area which is read at a glance from a height-weight curve published by DuBois[11], and the basal metabolism in terms of percentage of the normal standard from tables of average standards for various sexes and ages published

by Gephardt and DuBois[12], and based on numerous observations made by many observers, notably Means[13]. The calculation sheet published on opposite page from one of the periods of the case of polycythemia with splenomegaly reported, will serve as an illustration of how the work is done. On it the calculations are lettered in groups, to correspond to the following key:

(*a*) Volume per min. (in litres) =

$$\frac{\text{log. factor of spirometer} + \text{log. contents of spirometer} + \text{log. correction of barometer and temperature}}{\text{log. time}}$$

$$= \frac{\cdot 1652 + \cdot 5775 + \cdot 9629}{\cdot 9122} = \text{log. of } 6\cdot 21 \text{ litres.}$$

(The factor of the spirometer is required to reduce the amount of expired air which has been measured in c.m. to litres, and is found by measuring its diameter at three points of its height, and multiplying the square of the average radius by π, and is constant in each spirometer for all experiments. The barometer is corrected to standard pressure and density, by tables at the Smithsonian Institute, and to the temperature of the spirometer by tables made by Miss Sandiford).

(*b*) CO_2 per kg. per min. =

$$\frac{(\text{log. \% } CO_2 \text{ produced}) + \text{log. volume per min.}}{\text{log. weight in kilos}}$$

$$= \frac{\cdot 4928 + \cdot 7934}{\cdot 6405} = \text{log. of } 4\cdot 42 \text{ c.c}$$

(*c*) O_2 per kg. per min. =

$$\frac{\text{log. \% } O_2 \text{ absorbed} + \text{log. volume per min.}}{\text{log. weight in kilos}}$$

$$= \frac{\text{log. } \cdot 5453 + \cdot 7934}{\cdot 6405} = \text{log. of } 4\cdot 99 \text{ cc.}$$

(The oxygen absorbed is obtained by deducting the O_2 expired from the O_2 inspired corrected. The correction for oxygen inspired is obtained from tables by Miss Sandiford based on Haldane's formula, p. 26, "Gas Analysis").

(*d*) Respiratory quotient =

$$\frac{\text{log. } CO_2 \text{ per kilo. per minute}}{\text{log. } O_2 \text{ per kilo. per minute}} = \text{log. of } \cdot 89.$$

(*e*) Calories per square metre per hour =

$$\frac{\text{log. } O_2 \text{ per min.} + \text{log. calorific value } O_2 + \text{log. } 60''}{\text{log. surface area}}$$

$$= \text{log. of } 45{\cdot}3 \text{ calories.}$$

(The calorific value of O_2 for various respiratory quotients is obtained from tables by Williams, Riche and Lusk[14]. The surface area is calculated as above stated from the height-weight curve published by DuBois[11], based on the linear formula.)

(*f*) Basal metabolism in per cent. of normal =

$$\frac{\text{log. Calories per sq. m. per hr.} - \text{log. normal standard for age and sex of patient}}{\text{log. normal standard}}$$

$$= \text{log. of } 28.7\%$$

(The normal standard is taken from the table by Gephardt and DuBois[12].)

III. Observations made on a Case of Polycythemia with Splenomegaly (Osler's or Vaquez's Disease)

So far as is known to the writer, no report has as yet been published upon the basal metabolism of this condition, so that the somewhat scanty observations recorded below are worthy of report, especially as in them, the basal metabolism was found to be raised to a degree that compares closely with the values noted by other workers in pernicious anæmia.

The patient was a man aged fifty-eight in the medical service of Dr. C. F. Martin, to whom I am indebted for the privilege of making and recording this observation. He was admitted to the Royal Victoria Hospital on August 9th, 1916, complaining of flushed appearance, pain in left side, drowsiness, and feeling of fulness in the head, and gave a history of having been "flushed in the face" for thirty years, gastric trouble and splenic enlargement ten years, gastric hæmorrhage six years ago, blood in stools recently. Syphilis denied, but gonorrhœa several times. He was a rather tall man of a very florid high colour, especially in the face and extremities, the scalp, face and hands being of a deep pink and the hands becoming purple when held down. The peripheral venules were distended and the mucous membranes of the mouth and conjunctivæ very red. The spleen was enormously enlarged, reaching to the umbilicus and was tender to pressure and the liver projected below the costal border. The blood count showed 8,400,000 erythrocytes, 21,200 leucocytes, hæmoglobin 110 per cent., moderate anisocytosis, no nucleated reds. The urine was of sp. gr. 1024, acid with a trace of albumen and a few hyaline and granular casts. The blood pressure was not raised, systolic 130, diastolic 80. Pulse, 72–80. Respiration 22-24. Temperature, 98° rose occasionally to 99·2–99·4. The metabolism other than respiratory was fully studied by Dr. E. H. Mason, and is reported upon by him elsewhere. He found the nitrogen values normal. Irradiation with *x*-ray was done repeatedly. Discharged improved.

The basal metabolism was determined on two occasions, at an interval of five months. The first observation was made on August 23rd, 1916. The experiment was run in two periods, the average of the results showing a heat product of 40·9 *calories per square metre of his body surface per hour*, that is *a rise above the normal standard*, for individuals of his sex and age, *of sixteen per cent.*

The second determination was made on December 13th, 1916, two days before his discharge from hospital. 45·3 *calories per square metre were produced giving a raised basal metabolism of* 28·7 *per cent.* Two periods were run, but samples were only obtained from one. The calculation sheet from this single period is published under the technique (p. 000).

The following summary chart will show the values of interest in both experiments in detail.

ROYAL VICTORIA HOSPITAL

RESPIRATION CHART

SUMMARY OF METABOLISM DETERMINATIONS

Name Thos Dougall

Age 58

Case No. 24405

Diagnosis Polycythemia with Splenomegaly.

Normals: 3.13 3.72 0.84 35.2

DATE	WEIGHT	HEIGHT	TEMP.	PULSE	PERIOD NO.	TIME	CO_2		O_2		R.Q.	VENT. PER MIN. (S.T.P.D.)	HEAT IN CALORIES PER HOURS			
							PER MIN.	PER KILO PER MIN.	PER MIN.	PER KILO. PER MIN.			TOTAL	PER SQ. M.	% NOR.	
1916	KG.	CM.				A.M.	C.C.	C.C.	C.C.	C.C.		L.	CALS.	CALS.	%	
Aug. 23	43.3	162.6	98.0°	69	1	9.02	156	3.60	203	4.69	0.77	7.46				Experiment I
				68	2	9.26	153	3.53	211	4.87	0.73	7.53				
				69			155	3.57	207	4.78	0.75	7.50	58.9	40.9	+16	Average of Periods 1 & 2
Dec. 23	43.7	163.1	98.0°	66	II	9.00	193	4.42	218	4.99	.89	6.21	64.5	45.3	+28.7	Experiment II 3 samples obtained from one period only

Remarks. As stated above, the moderately raised basal metabolism of this case of +16 and +27·8 per cent. is very similar to that reported by Means, Aub and DuBois[12], as well as earlier workers, in pernicious anæmia, in which disease a moderately heightened metabolism has been noted in a number of the graver cases. In leukæmia, again, as is well known, the heat production as recorded by many observers[16] is still higher (40–60 per cent.), as also the general metabolism, a fact usually ascribed to the greatly increased white cell regeneration which is proceeding, and which constitutes an embryonic type of tissue. The obscure conditions existing from the metabolic standpoint in pernicious anæmia, in which red cell regeneration is combined with imperfect oxygenation of the muscular tissues of the body as a whole, make the raised heat values in the present case of polycythemia of added interest. For whether the erythrocytosis that is present here be primary or secondary, increased cell regeneration exists.

The subject of true erythræmia or primary polycythemia with cyanosis, with or without splenomegaly, or hypertension, has been reviewed by Lucas[17] in 1912. In connexion with a thorough study of two new cases reported he has collected and tabulated one hundred and seventy-nine from the literature, of which one hundred and forty-nine are undoubtedly genuine. He shows that the disease is now clearly established as a definite and not very infrequent entity. His review of the collected cases throws some side-light on the extremely interesting question of the etiology and the primary or secondary origin of the erythræmia, without, however, leading to any conclusion, as to the causation which still remains in obscurity. Thus in several cases the presence of a caseating hyperplastic tuberculosis of the spleen suggests a compensatory overfunctioning of the bone marrow (primary polycythemia); in others the existence of prolonged stasis suggests a compensatory increase of red cells to carry out the need of oxygenation of the tissues (secondary polycythemia); and in many others, again, the frequent and persistent hemorrhages suggest a vicious circle in which minute quantities of whole blood taken into the circulation act as a stimulus to regenerative bone marrow changes which in turn induce a plethora that is relieved by venesection and hæmorrhage. The action of a toxin causing deoxygenation of the body tissues is another possibility that would lead to a compensatory (secondary) polycythemia. Probably, just as in the pernicious anæmias, we are dealing with a mixed group, from which many cases with a definite etiology can in time be separated from the primary ones.

Summary and Conclusions

1. Through the organization of trained workers and resources, and the researches issuing therefrom, calorimetry has been reduced from an abstract physical science to the province of the well equipped clinical laboratory, and has now an accepted place among the methods of practical application in any large hospital with up-to-date facilities.

2. The basal metabolism of an individual is his heat production in the fasting and resting state, and is here calculated from his linear surface area as derived from the height-weight curve of DuBois, and is expressed in terms of percentage of the normal standard for his age and sex.

3. Clinical calorimetry may be carried out by direct or indirect methods, of which the latter are on the whole simpler and more easily followed by workers with limited assistance and resources.

4. The respiratory-valve and spirometer method of indirect calorimetry, of which the Tissot is the sample and familiar example, gives results that approximate closely, in reliable hands, to those of the direct method, it is simple, and the apparatus easily cared for. The modification installed by us at the Royal Victoria Hospital, Montreal, with the assistance of Dr. Walter M. Boothby, is described in this article and the technique and calculations.

5. Two observations made at an interval of five months are recorded upon a case of polycythemia with splenomegaly. The metabolism was raised on the first occasion 16 per cent., on the second 28·7 per cent.

6. This moderate rise of metabolism compares in an interesting way with cases of pernicious anæmia studied by others in which a similar rise was noted, in view of the red cell regeneration that frequently exists in both diseases.

7. The etiology of Vaquez's disease remains obscure, but the large and carefully studied casuistic, presented by Lucas, supplies the causation in a number of individual cases.

In conclusion, it is my pleasant duty to express my sincere thanks to Dr. Walter M. Boothby and Miss Irene Sandiford for the thorough instruction given me by them in the Tissot method, and for their assistance in this work in many other ways; to Dr. C. F. Martin for access to the clinical material studied, and support

of the work; to Miss M. F. Hersey, lady superintendent of the hospital for the coöperation of the nursing staff; to Dr. Louis Gross for the very excellent diagram of the vertical section of the spirometer in use here which he has kindly drawn; and to Mr. E. L. Judah, of the McGill Museum, for much help in adjusting the mechanical part of the apparatus without which it would have been difficult to proceed. I am also deeply indebted to Dr. Thorne M. Carpenter, of the Nutrition Laboratory of Boston, Mass., for giving to both manuscript and proof the benefit of his final revision.

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PROTEIN MILK—ITS COMPOSITION, PREPARATION AND APPLICATION IN THE TREATMENT OF DIGESTIVE DISTURBANCES*

By Alan Brown, M.B.
Howard Spohn, M.B. and
Ida F. MacLachlan, B.A.
Toronto

MUCH has been written concerning protein milk (*Eiweiss Milch*) in pediatric literature, till now scarcely an institution dealing with children in America would be without its use, yet in spite of its widespread employment among pediatricians, it still remains almost unknown to the general practitioner. We will therefore offer no apologies for the presentation of such a well-worn subject but will endeavour to present it in a practical manner, with the hope that it may be more universally and intelligently employed to the benefit of the coming generation.

For many years, physicians working on the problem of artificial nourishment of infants, have endeavoured to ascertain the reason for the difference in tolerance for cow's and mother's milk. All the constituents of the milk have been blamed at various times for the bad results, and it is probably true that the misfeeding of any one element may cause trouble.

Chemically speaking, cow's milk and mother's milk are not unlike; to be sure the protein of cow's milk is higher and is coagulated in coarser curds in the stomach. The next most striking difference is in the salt content, or the whey. Mother's milk having 0·2 per cent. while cow's milk has 0·7 per cent.

Finkelstein, of Berlin, who initiated protein milk to the profession, tried a unique experiment. He fed a series of infants on cow's milk casein and mother's milk whey and found that the infants thrived as though they were taking mother's milk. In another series he fed cow's milk whey and mother's milk casein and found these babies were subject to the same troubles as though they had been fed plain milk and water mixtures. From these

* From the Infants' Department and Chemical Research Laboratory—Hospital for Sick Children, Toronto.

observations he concluded that most of the trouble in the artificial nourishment of infants lay in the whey, or more properly speaking, the whey concentration, with a secondary pathologic fermentation of carbohydrates and fat.

A few years ago it was the general idea that all of the acute gastro-intestinal upsets were due to infection of the gut tract, and whereas this is true in a small percentage of cases, it has been proven that most of these cases are primarily due to intestinal cell harm caused by whey concentration with an overstepping of food tolerance.

We do not now look as much as formerly for the kind of flora of the intestinal tract, but instead, we determine the variety of bacteria by the food that is given. This at first glance appears queer but it is nevertheless true. The frequent acid, green explosive stools, are the fermentative stools caused by the whey or carbohydrate concentration with the fermentative bacteria acting on the carbohydrates and fats. These saccharolytic bacteria produces irritative fatty acids with increased peristalsis and mucus. This type of stool wastes the sodium and potassium salts with a consequent demineralization and relative acidosis which adds to the toxæmia. There is also a large water loss depending on the type of child and previous feeding.

A child can be rated as a good or bad child, depending upon its water-binding power or its water stability. Thus a child which has been fed on a poorly balanced high carbohydrate mixture such as is present in all patent foods, may lose one third of its weight in two or three days, while another child having the same disturbance may lose slightly or not at all. Thus the child's water-binding power has a great deal to do with the prognosis and treatment. In the administration of protein milk with its large protein content by adding to it a sugar which is not easily fermented (dextri-maltose) we produce instead of pathologic fermentation a condition of putrefaction which changes the acidity of the intestinal contents to alkalinity, the peristalsis is decreased, the intestinal contents pass slowly through the large intestines with absorption of fluid and excretion of calcium and magnesium salts. These minerals unite with fatty acids to form the typical fat-soap-clay-coloured constipated stools characteristic of protein milk feeding, and it is at this point that dextri maltose should be added to the food. In these stools the potassium and sodium and water loss is stopped, but the calcium and magnesium retention is lowered; however, this does not mean a negative balance because of the increased salt ingestion as is evidenced from the following Table I.

TABLE I.—COMPARISON OF THE SALTS OF DIFFERENT MILKS (COURTNEY AND FALES, N.Y.)

	Total Ash Per cent.	CaO	MgO	P205	K20	Na20	Cl
Protein milk (12 analyses)	0·648	0·201	0·021	0·222	0·109	0·032	0·061
Cow's milk (5 analyses)	0·743	0·176	0·020	0·206	0·189	0·050	0·111
Woman's milk (16 analyses of normal nature milk)	0·206	0·047	0·008	0·034	0·057	0·014	0·035

Preparation of Protein Milk

Method—(32-ounce quart used in this formula).

A quart of certified raw milk is taken; two teaspoonsful of essence of pepsin are added. Warm mixture to 140° F. Keep at this temperature ten minutes. (Too great heat will cause the curd to become tough). Then let it stand at room temperature for half an hour. The curd is then separated from the whey and placed in a cheese-cloth bag and allowed to drip in the refrigerator or any cool place. This takes from two to four hours and in large amounts may be allowed to drip over night. The curd is then worked through a fine sieve (thirty-six wires to the inch) at the same time adding one pint of a low acid buttermilk, and one pint of water or water to one quart. To every quart of finished protein milk, add one grain saccharin.

The buttermilk used is made from fat-free milk.

When using, the feeding must just be warmed slightly, so as not to curdle the milk.

Precautions to be Observed in Making Protein Milk

1. (*a*) Fat content of protein milk may be reduced by churning some of it into butter. To prevent this, all ingredients, curd, buttermilk and water should be absolutely cold when being worked through the sieve. A warm temperature helps in the separation of cream into milk and butter.

(*b*) The masher should not be worked in rotary motion. Pressure should be used each time to get the curd through, with the minimum amount of churning of the milk.

2. (*a*) As the curd is being put through the sieve it must be kept dripping wet with the buttermilk and water. If pressed through fairly dry, it clots on the underside of the sieve. These clots of fine curd never become evenly distributed through the milk, except by again putting through the sieve.

(*b*) If more liquid is required to keep the curd wet, than the necessary proportion of buttermilk and water, some of the protein milk already sieved may be used again.

This seems a long difficult unnecessary procedure, and many modifications have been tried always with more or less failure, so we would strongly advise adhering rigidly to the directions set forth. The technique has only been adopted after four years careful experimentation with various procedures.

Analysis

We have in this mixture a high proteid food with a finely divided curd and a moderately high fat content. The whey is the whey of buttermilk or is the mixture diluted one half, in this manner making the total salt content slightly less than cow's milk. The milk sugar, which is the carbohydrate of milk, is very much reduced, making it possible to add the very much less fermentable mixture dextri-maltose as the carbohydrate. It is important to bear in mind that a low acid buttermilk or lactic acid milk be employed, preferably with an acidity not greater than thirty-six.

According to Courtney and Fales, the total salts of the ash are greatly in excess of those of mother's milk. The amount of calcium is nearly five times and the phosphorus nearly seven times as great. The soluble salts also are nearly twice as abundant in protein milk. To this large excess of insoluble salts, especially calcium, is no doubt to be ascribed the value of protein milk in producing formed stools. From Courtney and Fales' observations there is no basis for the statement that protein milk is low in salts and this is certainly confirmed by our own analyses. In fact, the total ash content is higher than is ordinarily fed to infants, even when protein milk is diluted, the amounts are much greater than nursing infants receive.

The following procedures were employed in the analyses of protein milk in our own laboratory.

The protein milk was analyzed for moisture, ash, protein, fat and sugar.

Moisture. The milk was evaporated on the water-bath until it appeared dry, then heated in an oven about 95° C. for one hour, dessicated, and weighed.

Ash. The dried residue after the moisture determination was ashed carefully with a free flame until the ash was white, dessicated, and weighed.

Protein. The total nitrogen was determined by the Kjeldahl method—heating with concentrated sulphuric acid to remove the organic matter and combine the nitrogen as ammonium sulphate, neutralizing and alkalinizing to liberate the ammonia, distilling the ammonia into standard acid, and titrating to find the amount of acid used by the ammonia. The total nitrogen multiplied by 6·25 gave the protein.

Fat. Fat was estimated by the method of Saxon, in which the fat was dissolved in alcohol and ether, this extract evaporated, the residue extracted with petroleum ether, which was filtered, the petroleum ether was evaporated leaving the fat. The fat was dried about 95° C. one hour at a time, dessicated and weighed to constant weight.

Sugar. The method of Hill was used for sugar.

The proteins of the milk were precipitated by a dialyzed ferric hydroxide solution, removed by filtering, and the lactose in the filtrate found by titration with Benedict's solution.

The results of the analyses may be seen in Table II.

TABLE II MADE FROM 4% WHOLE MILK

Sample Number	Date 1916	Moisture %	Ash %	Protein (N.X. 6.25)%	Sugar %	Fat %
76	June 12	93·80 93·46	0·51 0·50	2·94 2·98	1·69 1·61	1·80 1·78
77	13	95·69 95·39	0·44 0·48	3·16 3·09	1·54 1·54	1·20 1·15
78	14	93·55 93·44	0·57 0·57	3·08 3·10	1·73 1·78	1·45 1·46
79	15	94·29 94·07	0·54 0·54	3·05 3·13	1·80 1·78	1·31 1·30
80	16	93·55 93·59	0·60 0·58	3·16 3·33	1·57 1·57	1·49 1·54
81	17	92·36 92·89	0·59 0·60	3·51 3·44	1·33 1·35	2·05 2·06
82	18	93·96 93·88	0·63 0·61	3·47 3·42	1·65 1·61	1·96 1·91
83	19	94·65 94·73	0·51 0·48	2·75 2·69	1·61 1·57	1·72 1·71
84	20	.....	....	3·21 3·01	1·54 1·50	1·41 1·26
85	21	.....	....	3·40 3·35	1·63 1·65	1·68 1·59
	Ave.	93·96	0·55	3·16	1·60	1·59

The average composition thus being—Fat, 1·6 per cent; sugar, 1·6 per cent.; protein, 3·16 per cent.; ash, 0·55 per cent.; giving a caloric value of ten to the ounce. It would thus require half an ounce of dextri-maltose to twenty ounces of protein milk to raise the sugar content to 3·5 per cent.

Indications for the Employment of Protein Milk

In severe cases of diarrhœa which do not respond to the elimination of carbohydrate in the usual milk mixtures, protein milk is indicated, as in practically all cases of intoxication and infectious diarrhœa and many cases of dyspepsia in breast fed infants. We have also found it most useful in chronic intestinal indigestion in older children. Last, but not least, is its employment most essential in the preliminary corrective stage of atrophy or marasmus.

Technique of Administration

Children usually take this milk readily, the only difficulty being encountered when it is given to children over a year, when, in order to get them to take the mixture, it is essential to starve them; in exceptional instances it should be given with a stomach tube. The milk should not be heated too rapidly nor above 90° F, otherwise tough masses of casein are likely to form. A large hole in the nipple is necessary and the feeding should be interrupted and the bottle thoroughly shaken every one or two minutes in order to keep the casein from settling to the dependent part of the bottle while the fluid portion alone is being consumed.

Duration of Administration

The length of time that protein milk should be continued depends primarily on the digestive condition and secondarily on this factor plus the gain or loss in weight. If, at the end of two or three days on protein milk there is no improvement in the number or character of the stools, with even slight gain in weight, no addition is made to the diet until the stools assume the appearance characteristic of a pure protein milk diet. This will come about usually in four to eight days and the stools then are quite regular, one or two daily, very large, light yellow, of the consistency of putty, rather dry, without odor and are free from any unmixed particles or mucus. If, on the other hand, in the first few days there is loss of weight—and this is more frequently met with than

gain—on the first appearance of betterment in the digestive condition, additions to the protein milk are begun.

The corrective period naturally divides itself into four stages:

1. That in which the protein milk alone is given.
2. That in which the protein milk plus dextri-maltose or barley flour is given.
3. That in which the protein milk plus a small amount of plain milk is given.
4. That in which protein milk is largely replaced by plain milk dilutions.

The majority of the cases were kept on protein milk for a period varying from three to four weeks and in many instances, contrary to the usual opinion, we were able to keep the children on protein milk plus starch and dextri-maltose, sufficient for their caloric needs for a period of several months, in each instance accompanied by a substantial gain in weight and normal increase in vigour and tissue turgor with comparative freedom from digestive symptoms. There was usually experienced little difficulty in weaning to an appropriate milk mixture, and only in rare instances was it necessary to return to the previous protein milk feeding.

The usual duration of the first stage was from six to eight days —in exceptional instances it being impossible to add carbohydrates before the third week.

As soon as the digestive condition showed some improvement, the first step toward increasing the food value was made by the addition of malt sugar in the form of dextri-maltose. This should be added gradually to the day's food supply, beginning with one teaspoon and increasing to one and a half to two and a half ounces. Occasionally, when the carbohydrate tolerance was extremely low, cooked barley flour was added gradually up to one or one and a half ounces, as this appeared to exert a less laxative action. The caloric value of both these food elements being respectively one hundred and twenty and one hundred calories to the ounce, it thus being possible to soon fill the infants' needs by these additions.

The average duration of the second part of the corrective stage varies from two to four weeks and in many instances for as long as eight months. Those that were kept on protein milk plus carbohydrate for any considerable period showed a consistent increase in weight. It was found that the addition of milk and water mixtures could be made either gradually or suddenly, and rarely was it necessary to return to the original protein milk feeding. In many cases protein milk was used in conjunction with breast milk feeding.

Calories and Weights

While in the corrective stage on protein milk alone, the calories naturally were low and pronounced gain in weight was not expected. Such was the apparent influence of the protein milk on the assimilation of the other food added, however, that gain was noted in many cases where none was looked for. It is not to be expected that young children will gain in weight when taking less than thirty-five calories per pound of body weight, yet as is seen from the case reports, many of our infants did.

Case Reports

Infants one to three months, twenty cases, average weight eight pounds, two nursed, thirteen fed on milk mixtures, and six on proprietary foods, seventeen diarrhœa, two decomposition and one for feeding. Ten were acutely ill on admission and three moribund, while only seven were not acutely ill. Six died, three were improved and left the hospital, while eleven were discharged cured. The babies were started on a diet of protein milk averaging twenty calories per pound, and in the diarrhœa cases, sugar was added in five days as barley flour or dextri-maltose 1·8 per cent. In decomposition cases, sugar was added earlier and as high as 3 per cent. During their stay in the hospital, the infants lost on an average of nine ounces but afterwards gained ten ounces, and were in the ward an average of twenty-one days.

Three to six months, twenty-five cases, average weight nine pounds; thirteen fed on milk mixtures and twelve on proprietary foods. Fourteen had fermentative diarrhœa, in two of which it had arisen as a complication of bronchitis and syphilis. Eight decomposition and three to have feeding adjusted. Two were moribund on admission, ten acutely ill and thirteen not acutely ill. Five died, the other twenty were discharged cured. These infants were started on an average of thirty-four calories per pound protein milk and the diarrhœa cases had recovered in an average of nine days, and sugar was added 1·4 per cent. The decomposition cases had sugar added in two days to 3 per cent. They lost an average of fifteen ounces and gained fourteen ounces before being discharged. They were in the hospital an average of twenty-seven days.

CHART NO. I

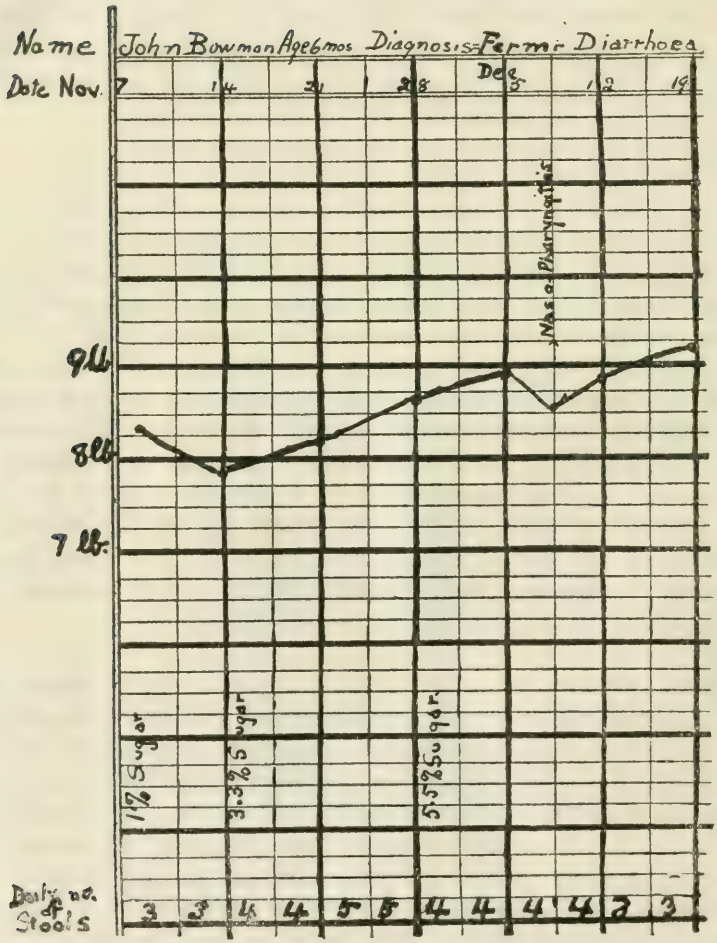
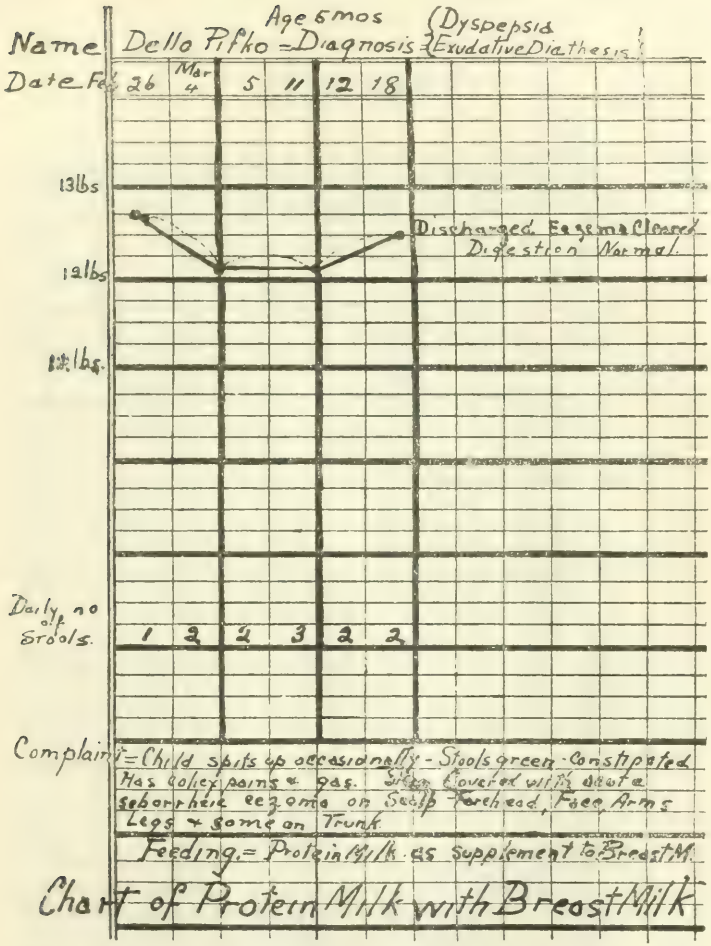

Name John Bowman Age 6 mos. Diagnosis Fermi Diarrhoea
Date Nov. 7 14 21 28 Dec. 5 12 19
Mass Pneumonia
9 lb.
8 lb.
7 lb.
1½ Sugar
3.3.½.5 Sugar
5.5.2.5.0 Sugar
Daily no. of Stools 3 3 4 4 5 5 4 4 4 4 2 3

CHART NO. II



Six months to one year, forty-six cases, average weight twelve pounds six ounces. Previous feeding for thirty-one, milk mixtures; ten proprietary foods and five were nursed. Thirty-five had diarrhœa in which three had also eczema, seven decomposition and four rickets. Complications were bronchitis, tetany, rickets, furunculosis. Four were moribund on admission, nine acutely ill and thirty-three not acutely ill. Six died and thirty-nine cured, while one was unimproved. They were given an average of thirty-six

CHART NO. III

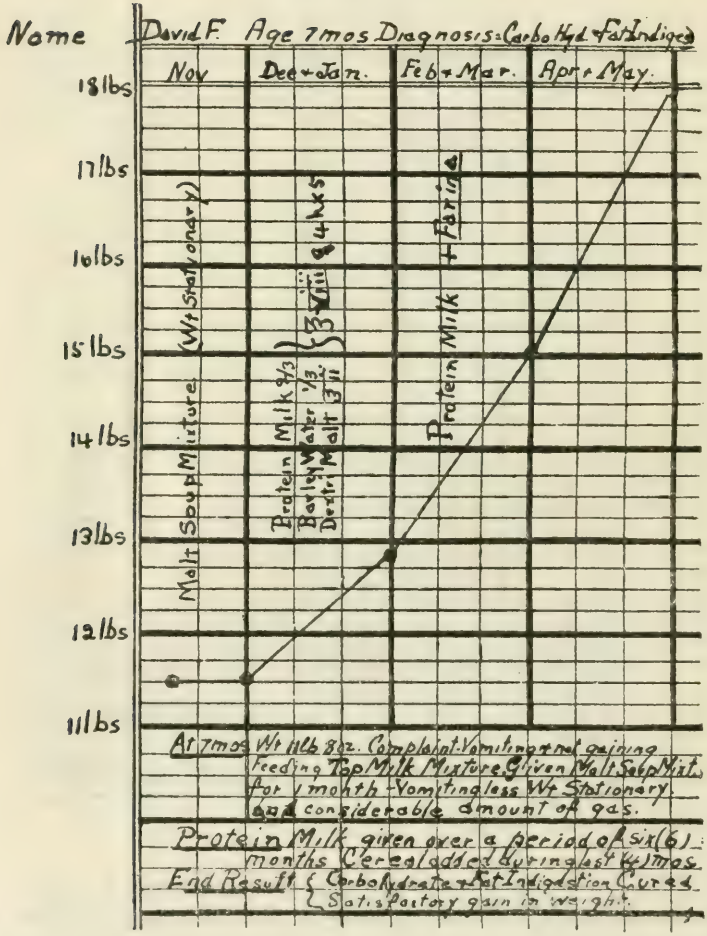
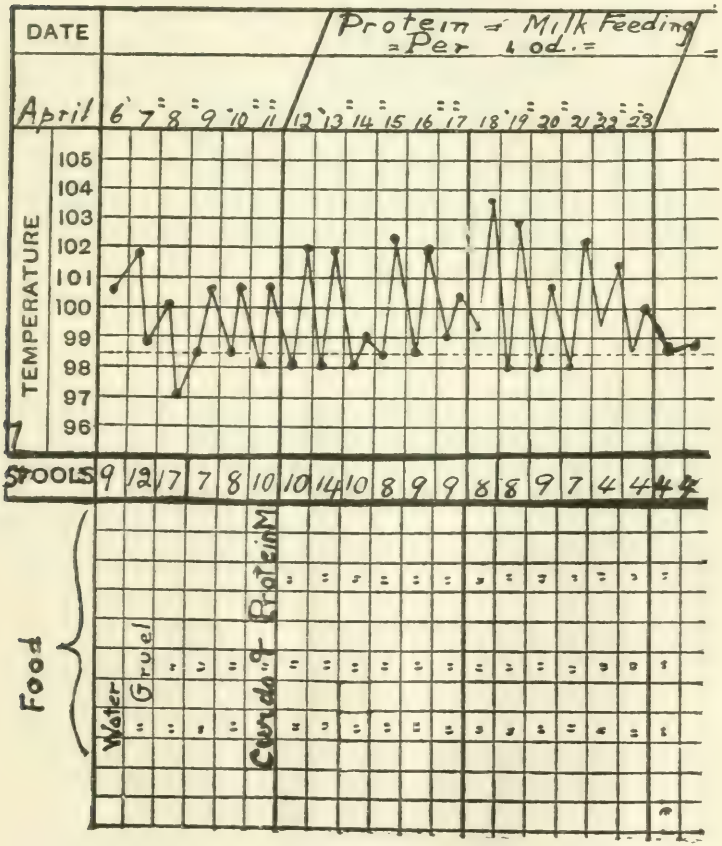

Name
David F.
Age 7 mos.
Diagnosis: Carbo Hyd + Fat Indigest
Nov
Dec + Jan.
Feb + Mar.
Apr + May.
18 lbs
17 lbs
16 lbs
15 lbs
14 lbs
13 lbs
12 lbs
11 lbs
Malt Soup Mixture (Wt Stationary)
Protein Milk 2/3
Barley Water 1/3
Dextri Maltose 3%
3 Viii 4 hrs
Protein Milk + Farina
At 7 mos. Wt 11 lb 8 oz. Complaint: Vomiting + not gaining
Feeding Top Milk Mixture Given Malt Soup Mix.
for 1 month - Vomiting less Wt Stationary
and considerable amount of gas.
Protein Milk given over a period of six (6)
months Cereal added by syringe last 4 mos.
End Result { Carbohydrate + Fat Indigestion Cured
Satisfactory gain in weight.

CHART NO. IV

NAME C.C. Age 7 years.

DISEASE Infectious Diarrhoea.



calories per pound protein milk and in eleven days the diarrhœa was controlled enough to add sugar as barley flour and dextrimaltose 1·5 per cent. They lost an average of fourteen ounces, but gained thirteen ounces before leaving the hospital. The average time in the hospital was thirty-two days.

Over one year, nine cases, average weight, fifteen pounds eleven ounces. Three had been fed on milk mixtures, four soft diet and two proprietary foods. Two were acutely ill and seven not acutely ill. Two died and seven were cured. They were given thirty calories of protein milk per pound and in the diarrhœa cases sugar was added after six days 2 per cent. barley flour or dextrimaltose. Rickets and malnutrition cases were changed to soft diet in a week. The average weight lost was ten ounces, and the gain twelve ounces. They were in the hospital for an average of thirty-four days.

The authors desire to express their indebtedness to Muriel R. Farmer, B.A., of the pasteurizing department of the hospital for her coöperation in the work and to Charles Farquharson, M.B., for the preparation of many of the case reports.

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MALARIA IN THE ARMY

By Lieut.-Col. E. J. Williams, D.S.O.

Officer Commanding Canadian General Hospital

THE incidence of a large number of cases of malaria among the troops serving in Egypt, Greece, Mesopotamia and other countries where the disease is prevalent, calls for close attention and the serious consideration of not only the Army Medical Service, but also the whole medical profession.

While men affected with the disease remain in the army, they will come under the care of military medical officers, but, when discharged from the service, the civilian physician will be called upon to treat them.

Under such conditions it would appear expedient to call the attention of the medical profession to the matter as it exists at present.

As has already been stated, a large number of men in the armies in the East have contracted malaria. Some of these men have already returned to England, Canada, Australia, and other countries; many more will follow. The great majority are carriers, and under "suitable circumstances" will spread the disease in the localities where they reside.

The question of "suitable circumstances" is one which demands careful study and in order to follow this question it would be well to consider the opinions advanced by Sir Patrick Manson, Chalmers, Castellini and other authorities on tropical diseases, relating to this phase of the subject.

Although the malarial area is defined as lying between sixty-three degrees north latitude and thirty-five degrees south latitude, cases of malaria do exist far beyond these limits. Malaria exists in England, Canada, Australia, New Zealand and the United States. These are the countries which concern us chiefly at the present time.

Another point to take into consideration is the fact that the geography of malaria may alter very considerably from time to time and, while one part may become less, others may become

more malarial. This is due, no doubt, to conditions other than temperature alone. Of these conditions, one of the most important is atmospheric moisture. The low lying, undrained, swampy areas are the most favourable for the development of the anopheles mosquito, the carrier of the plasmodium malariæ, and it is in such places that the disease is most commonly found.

A malarial area may, however, be "created" by the damming of small streams and so causing a flooding of the adjacent land, or again pools may form along the edges of a stream and prove a breeding ground for the anopheles. These two conditions were potent factors in the spread of the disease in high level areas occupied by the troops in the East.

The influence of the rain fall in causing augmentation of the disease could not be determined with any certainty in the Salonica area.

The presence of trees, shrubs, plants, grass in the vicinity of flooded or swampy areas and along streams favours the development of the anopheles as these latter seek protection in such places in the day time. There may be areas which answer all the "requirements" from a geographical and climatological standpoint and still no malaria exists. On the other hand, in places which have few of these "requirements" malaria may be quite common. So, in studying the etiology of this disease, we must disabuse our minds of the idea that development of the disease will take place *only* in low lying swamps and morasses.

Mention may be made of certain conditions which tend to precipitate an attack of malaria in individuals in whom the disease seems to have been dormant (latent malaria) and also which may cause relapses and recurrences in those who have already suffered from previous attacks. Of these conditions we might note:

1. A change from a warm to a cold climate.
2. Increased activity causing extreme fatigue.
3. Sudden change in one's mode of living such as, change of diet, hours of work, reduced period of rest and sleep, etc., all taxing the internal economy of the human system and rendering it less resistant to the influence of micro-örganisms.

In the East the two commonest factors which acted as exciting causes were: (1) Exhausting work; (2) High temperature.

The largest number of cases admitted to hospital occurred in the hottest months of the year, viz.: July, August and September, while extreme fatigue following a long march was noted as a very common condition in many of the cases of relapses.

Immunity. It has been stated that certain races and certain individuals are less susceptible to the disease than others. The negro of Africa and the West Indies, the Chinese and the Malays, seem to enjoy comparative immunity and although some cases do occur in these races, they are, as a rule, of a mile type. In the matter of individual immunity, the same thing also seems to exist, the reason for such being as yet unknown.

In the Salonica army there were hundreds of cases of men exposed to infection for a period of two years and yet in whom the disease did not develop. In many of these cases quinine had not been taken as a prophylactic measure.

The question as to the value of quinine as a prophylactic is one which was closely studied in different hospitals in Salonica, and the consensus of opinion of medical officers consulted was that such a measure is of doubtful value.

It may be of interest to record some data in connection with our experience with malaria in the personnel of our hospital. The total personnel numbered one hundred and sixty-three.

Development. No cases developed until the first week of July, 1915, during which month there were eighteen cases. This corresponded with the commencement of the disease in the army generally, in Salonica.

So we may state with a fair amount of accuracy that the malarial season in that section of country commences at that time. During the month of August there were twenty-six new cases; in September, twenty; in October, eight; in November, two; in December, nil; in January, 1916, five, February to June, six; July, seventeen; August, nil. These figures refer to primary attacks only.

Recurrences. The rates of recurrences were very irregular, depending on the occurrences of such contributing causes as:—extreme heat or cold, increase of duties in the hospital, and the incidence of minor ailments which reduced the vitality and resisting power of the individual.

The number of recurrences during a period of sixteen months varied from five to twenty, the average number being nine.

Quinine in doses from 10 to 20 grains daily for three months, and every third day for three months, and then once a week was being administered to all these patients during the period when these recurrences took place.

The return of the unit to England heralded a repetition of recurrences which had not been experienced by some of the patients for two months.

Types. The type most commonly met with was the benign tertian, there being only eight of the malignant type.

Complications—A very common complication was an obstinate diarrhœa which at first was attributed to medication, but later was found to be due to a mixed infection of bacillary dysentery and malaria. This was quite common in the cases of men of the unit, as over fifty per cent. had suffered from bacillary dysentery on the Island of Lemnos during the summer of 1915. Thanks to the splendid work of Captain Graham (Toronto General Hospital), this was detected early in the season and so appropriate treatment instituted.

Anæmia. This was marked in over fifty per cent. of all cases and was commonly accompanied by emaciation due to the inability of the patients to take or assimilate food during the attacks which in many cases recurred frequently. The large doses of quinine taken, may also have been a contributing cause. No cases of so-called malarial cachexia were noted in the personnel.

Cardiac dilatation was a very common condition in recurrent cases and one which might be easily overlooked unless sought for. This feature should be carefully observed as improvement is very slow under the most careful treatment and if neglected may result in permanent disability.

The above were the common complications met with in the series of cases under discussion. The statistical table given below may give one a clearer idea of the situation.

Personnel	No. of Cases of Malaria	Date of Development											Max. No. of Recurrences	Min. Recurrences	Types			
		June—1916	July—1916	Aug.—1916	Sept.—1916	Oct.—1916	Nov.—1916	Dec.—1916	Jan.—1917	Feb.-June	July—1917	Aug.—1917			Average Record	Benign	Malignant	Other
163	82	0	18	26	20	8	2	0	*5	6	2	0	20	4	9	70	8	2

* Developed on return to England.

Treatment. The question as to the absolute cure of the disease by the administration of quinine, arsenic and other drugs, is still unsettled. One thing is certain, viz:. to prevent a recurrence

of the malarial symptoms of a patient, a systematic, prolonged course of treatment is necessary. The form of quinine best suited to combat the disease, the length of the period over which the treatment shall be continued, the procedure adopted for the carrying out of the treatment are matters worthy of consideration.

Form of Drug. Quinine has long been recognized as the one drug which acts most favourably on the plasmodium malariæ. The value of the drug is enhanced by the addition of arsenic in the majority of cases.

The tablet or powder form has not proven as efficacious as the solution with sulphuric acid. The sulphate of quinine in the acid solution is the most commonly employed form for administration by mouth. However, in some cases where the desired effect is not obtained, the hydro-chloride or bi-hydrochloride in solution has been given with better results. The dose of the sulphate is from 20 to 30 grains daily, of the hydrochloride or bi-hydrochloride, 7 to 15 grains.

The intramuscular method has met with better results on the whole than that by mouth. Still, abscess formation at the site of the injection is not uncommon, and so this method does not meet with general favour. The bi-hydrochloride is used, the dose being from 5 to 10 grains.

The intravenous method is, without doubt, the most efficient and, where ordinary care and skill is shown, practically devoid of danger. The action of the drug is much more rapid and the amelioration of the symptoms more marked than in the other form of administration. 5 to 7 grains are given in 200 to 300 ccm. of normal saline solution once or twice a day. In severe cases 30 grains may be given in twenty-four hours. In malignant cases, and especially those of the cerebral type, this is the only form of administration which seems to produce any appreciable effect. The administration of arsenic in addition to quinine is advisable in practically all cases.

The length of period over which the drug should be administered is estimated differently by different authorities, some advising a daily dose for three months, others intermittent dosage over a period of from twelve to eighteen months.

From the experience with the troops in the East over two malarial seasons, where recurrences of attacks during the second summer in those who had suffered with malaria during the first season were so common, the twelve months period of treatment seems to be the minimum.

It must be admitted that in only a small minority of the cases was the treatment carried out faithfully, still, even in this class, recurrences were not uncommon.

The following schedule would appear to meet all requirements:

For the first three months, 10 to 15 grains quinine daily.

For the second three months, 10 to 15 grains quinine three times a week.

For the third three months, 10 grains quinine twice a week.

For the fourth three months, 10 grains quinine once a week.

However, no definite statement can be made in this matter until a large number of cases have been observed where the systematic treatment is carried out over a long period.

The treatment by the intravenous method for all cases might solve the problem of cure and ere long we may see this procedure carried out just as is done in cases requiring "606". As this procedure has not yet been adopted, nothing definite can be reported.

The question as to how this systematic treatment can be carried out is a difficult one.

In the Salonica army a quinine parade is carried out in many units and so a close check kept on the treatment. This is only practicable in areas where large numbers of troops who have suffered from malaria are stationed for a long period. When these men are scattered to the four corners of the world where malaria is practically unknown, the treatment must be left to the individual to carry out.

Something might be accomplished by instructions issued through circular letters to the patient from time to time embodying details as to course of treatment, etc. A report from the patient might be rendered to the D.M.S. once a month, compiled and signed by a medical officer in the area in which the soldier is located.

The efficiency of the procedure would depend a great deal on the sincerity of the patient and this could be strengthened by a constant effort on the part of the medical service to keep in touch with and instruct the patient as to the absolute necessity of following out a systematic treatment over a long period, in order to prevent a recurrence of the disease.

Conclusions

1. A large number of malarial patients will be distributed in different countries where, previous to the war, very few existed.

2. Granted the presence of the anopheles mosquito, there is a likelihood of the disease spreading in these localities.

3. The influence of high temperature and hard labour is very marked as causative factors rendering the individual susceptible to infection and recurrent attacks.

4. The value of quinine as a prophylactic measure is doubtful.

5. The commencement of the "malarial season" in Macedonia dates from the latter part of June. This may depend on the nature of the season as regards continued high temperatures. The marked subsidence in primary cases dates from the month of October.

6. The most effectual form of treatment is the intravenous method.

7. Treatment must be continued over a period of from twelve to eighteen months.

The Army Medical Service of Great Britain has achieved a wonderful record. It has met and successfully combatted typhoid fever in a manner undreamed of in earlier centuries. In the South African War 57,000 casualties occurred from this disease alone. In the Napoleonic wars 97 per cent. of the deaths was due to typhoid fever. The percentage in all the theatres of the present war does not amount to 4 per cent. Had the experience of the South African campaign, in which 63 per cent. of the deaths was due to typhoid fever, been repeated in France the casualties would have exceeded half a million, since the strength of the South African army rarely exceeded 200,000. This mean that the British Army Medical Service has added to the strength of the Army half a million men.

ABSCESS OF THE LUNG

By W. A. Wilkins, M.D.

Radiologist, Montreal General Hospital; Consulting Radiologist Drummoud Street Convalescent Home; Demonstraton of Radiology, McGill University

ABSCESS of the lung, at times forms one of the most formidable problems with which we as roentgenologists have to deal. The extreme seriousness of the disease demands that we exert ourselves to the utmost, and the frequently indefinite *x*-ray appearances make the task of interpretation a difficult one. In addition, the patients are often so ill that their condition may handicap us at the examination. It is true that large cavities do not often present difficulties, but the exact localization or even recognition of the smaller ones will tax our powers; and these are the very cases in which our services are most desired.

Occurring as it generally does as a secondary process during some existing disease such as pneumonia, the clinical signs of the complication may be so confusing that the internist may be unable to do more than suspect its presence, and at the *x*-ray examination, the abscess may be so small or so masked by the original disease, that we, too, may be unable to speak positively—the shadow of the primary disease entirely obscuring the shadow of the early abscess. The inability to find it at the *x*-ray examination does not necessarily exclude its presence, but it is strong presumptive evidence of its absence, or at least of its inaccessibility to surgery; and, moreover, it has been my experience, that no matter how suggestive the clinical case may be for abscess, if it is not supported by the *x*-ray findings, surgical intervention is likely to be of little service, and may even be disastrous.

Although this paper is presented to a gathering of roentgenologists, it does not follow that we are concerned only with what we see on the screen or plate. We much go farther and enquire into the why and the wherefore of what we see. We must utilize our

Read at the forty-eighth annual meeting of the Canadian Medical Association, Montreal, June 13th, 1917.

knowledge of pathology and study the course of the disease as revealed by the chart and by the clinical history. A negative tap is undoubtedly of value in excluding empyæma and the fœtid odour of the breath or the finding of elastic tissue in the sputum is indicative of the destruction of lung tissue. Everything that has a bearing on the case should be considered in connexion with the reading of the *x*-ray plates. In many cases an *x*-ray diagnosis may be warranted without clinical information, and these are generally the cases in which the clinician would be able to assert his diagnosis without the aid of roentgenology. Further, one must be careful not to be biased in his interpretation by information received from other sources; but this information should be made to bear directly upon the case, being either corroborative or exclusive. I believe that if at times we fail in the diagnosis, it is because we no not dovetail the clinical evidence of a pathological process with the *x*-ray evidence of a pathological process; we are more concerned in giving a name to a disease than we are in describing and interpreting what we see with the screen or on the plate. In our anxiety to label the condition, we neglect the physics of *x*-ray light and the pathology of the human body, so that our so-called "interpretation" may be really nothing more than a shrewd guess. It is reasonable to expect that the shadow cast by the results of the reaction of the tissues to invasion should not differ markedly from one another in the quality of the shadow, in such conditions as pleurisy, empyæma, pneumonia, abscess, etc.; accordingly the mere presence of the shadow cannot be diagnostic of any one condition except insofar as the special pathology of the disease may influence it. Although the first step in the diagnosis is the recognition of a shadow, it is really with the special pathology of dise se which we must deal in the interpretation. If at the *x*-ray examination of the chest, a shadow is present in a situation where normally it should be clear, it merely means that some pathological process is present in the chest wall or within the chest. The situation, distribution, size, shape and quality of the shadow must all be carefully analysed and be in accord with the underlying pathology of the disease; and further, if a diagnosis of abscess is made, our duty does not end there, for we must be able to state definitely the situation of the lesion. It is of vital importance for the surgeon to know from which point on the surface of the body, the abscess is most accessible. This information will be available if the diagnosis is accurate.

Is is feasible to consider abscess and gangrene together. Each

results from the destruction of lung tissue; if the destruction occurs "*en masse*," gangrene is the result; if molecular, abscess. Perhaps a distinction could be made between them roent genologically, the central "core" of the gangrenous mass being surrounded by a small quantity of air, differing from the "air above and pus below" appearance of abscess. Personally, I have never accomplished this.

Regarding the cause of abscess, it may be said to occur almost invariably as a secondary process, pneumonia being by far the most frequent cause. It may also occur in empyæma, malignancy, suppurative conditions of the mediastinum or in suppurative conditions below the diaphragm. It may arise even in a healthy lung as from septic emboli, foreign bodies or from trauma, but it most frequently occurs in a lung in which some pathological process is already present. It may be single or multiple. Its situation may be anywhere, but appears to occur eith greatest frequency in the right upper lobe, the left lower lobe being next in frequency. Its size may be less than one inch in diameter or as large as the entire lobe. It may be single or multiple. It is generally more or less circular in outline. The contents are ordinary pus and air plus the remains of partially disintegrated lung tissue. The walls of an abscess cavity consist of three layers, an inner necrotic, a middle infiltrated with inflammatory products and an outer consisting of more or less œdematous lung tissue. If the process of formation has been slow, a limiting membrane of new fibrous tissue will be formed. These are the conditions present, the shadows of which we endeavour to identify on the plate. It is not possible to recognize each constituent of the wall as a separate entity, but all three combined are sufficiently developed to produce a contrasting shadow of demarcation. If evacuation of the abscess has been complete, cicatrization of the entire area may take place producing a uniform shadow on the plate. Generally a certain amount of air is present in the cavity which gives to it the typical appearance especially in the vertical position.

As nearly all pathological processes of the chest cast shadows on the plate, any one of them is likely to be confused with abscess; accordingly it is necessary to consider the special features of the more important ones in order to determine in what manner they may differ from abscess. It has been my experience that bronchiectasis frequently presents difficulty in recognition with any degree of certainty, and the clinician is as frequently undecided between it and abscess. At the *x*-ray examination, in spite of the great differ-

ence in pathology, the indecision may remain in certain cases, or one may say with greater emphasis, under uncertain conditions. Clinically the case may simulate abscess, the odour of the breath may be pronounced, and the *x*-ray examination suggest small multiple abscesses. If the condition is marked, and our examination is satisfactory, little difficulty will be experienced, for the shadows of the dilated bronchi with thickened walls generally filled with secretion, is characteristic of no other condition. These are seen on the plate both longitudinally and on cross section. The appearance will vary, depending upon whether the dilated bronchi contain secretion or not. If empty, the large white circles of the thickened walls of the bronchi on cross section and tubular appearance longitudinally will be seen. If containing secretion, the clear appearance of air will be replaced by shadow.

Pleurisy, with effusion, under ordinary circumstances, is not likely to be confused with abscess. The shadow generally commences at the base obscuring the diaphragm, and extending upward to a varying extent, thins out at its upper limit. Its free edge is more or less linear and the shadow is generally a large one, often occupying the whole of one side. The lung area above the fluid level frequently exhibits increased radiability, as may also the lung of the other side. Displacement of the heart shadow is the rule in left-sided effusion. These features are sufficient to prevent it from being confused with abscess; in fact it has little in common.

Empyæma, if extensive, presents the same general features as pleurisy, although the shadow is usually denser. If small, as is more frequently the case, it may require to be distinguished from abscess. Its situation at the base, its more or less irregularity of outline due to adhesions, and its more uniform density and the absence of air from the shadow are points in favour of empyæma. Interlobar pleurisy or empyema may lead to great difficulty in diagnoisis, but the situation and shape as determined fluoroscopically or with stereoscopic plates are generally sufficient to avoid error. Pneumonia often presents difficulty in diagnosis. The characteristic appearance of pneumonia is unmistakable, but so often before resolution has occurred, the question of abscess will arise and the consolidation of the pneumonia may mask or hide the shadow of early abscess. No difficulty will be experienced in recognizing the pneumonia, but difficulty may arise to decide whether abscess is present. The presence of free air would be indicative of cavity formation. Even the thickened pleura may cast a shadow not

unlike a dense abscess. The irregularity of outline, its more or less uniform density and the absence of air serve to differentiate, and stereoscopic plates will show the true position of the shadow. In addition, the clinical history will have little in it to suggest abscess. New growth, either from the pleura, lung or mediastinum, is not likely to be confused, the sharply defined demarcation and uniformity of the shadow being characteristic. Nor is aneurism likely to lead to error.

Regarding the technique of the *x*-ray examination, little need be said, fluoroscopic examination and stereoscopic plates generally reveal all the information desired. Besides being of great value as an aid to diagnosis, the fluoroscopic examination is valuable in localization. By manipulating the patient and observing the differences in density or distortion with the screen anteriorly and posteriorly, one is able to obtain fairly accurate information concerning the situation of the abscess. Stereoscopic plates afford an excellent opportunity to study the condition at leisure. Single plates made in one plane only are far from satisfactory, and even when sufficient to establish the diagnosis, convey no information concerning the location of the abscess. The examination should be made in the vertical position whenever possible, but unfortunately many of the patients are too ill to permit of this procedure. This difficulty may be overcome to a great extent by means of a tilting table. Failing this, one will have to content himself with the horizontal position. The *x*-ray appearance of abscess is so well known that description of it may be superfluous. Nevertheless it is by no means a constant picture. It is the result of a cavity which contains fluid pus and air generally in the midst of pathological lung tissue. There is a limiting membrane more or less circular or oval, containing in the vertical position a lower dense shadow and an upper of clear air. The proportion of the two latter will vary, depending upon the size of the abscess and the quantity of secretion present, the upper level of the fluid being horizontal in the vertical position. In the horizontal position, the sharp division into two areas is not seen, and the abscess may be represented either as an area of increased density in the midst of a dense area of pathological lung; or have a more or less mottled appearance due to the presence of air. Again, if the cavity is empty at the time of the examination, it may appear as an area of increased radiability, the appearance of an air-containing cavity. In gangrene where the destruction has occurred "en masse", the dense

shadow will be central surrounded by a rim of air. This is seldom seen or recognized.

In concluding, I would emphasize that to obtain the greatest value from the *x*-ray examination, it is of supreme importance that the roentgenologist work in collaboration with the internist. It is best to see the patient together, preferably at the screen examination, or, if this is not possible, to at least consult over the plates.

Case Reports

TWO CASES OF DERMOID TUMOURS COMPLICATING PREGNANCY, WITH OPERATION

By. J. N. Hutchison, M.D.

Winnipeg

THESE peculiar tumours, which are more or less common, are no doubt congenital in origin. Numerous theories have been advanced as to their cause, but these I shall not discuss. Various locations are the eye, mouth, brain, mediastinum, mesentery, the favourite location being the ovary. While congenital in origin, they frequently develop in the early years of life, but may, and often do, remain dormant until long after puberty—a favourite period for their development being the child-bearing period. One authority reports eighteen cases occurring in early life as follows: five in virgins under twelve years of age, six in children six months to two years, four in female fœtuses at birth, three in fœtuses prematurely delivered. They vary in size from a hen's egg to that of an adult head, but may be much smaller or much larger. Their consistency is hard, usually round and smooth with sometimes bony projections. Occasionally both ovaries are affected, but usually only one, and there may be several cysts in connection with the same ovary. Howard Kelly reports that in eighty-seven cases the dermoid was unilateral in all but one in-

Read before the Winnipeg Medical Society, April 19th, 1918.

stance. Their contents are usually fat, hair, teeth, traces of bone or cartilage, cholesterin and even brain and nerve tissue. Teeth, when present, are usually embedded in the cyst wall or attached to pieces of bone and occasionally are very numerous, one case being reported with three hundred present. Although in themselves harmless, they sometimes become very serious and should therefore always be removed wherever possible. The usual dangers are:

1. Suppuration and rupture into the peritoneum or perforation into the bladder or the bowel.
2. They may develop into large ovarian cysts filled with fluid.
3. They may become twisted on their pedicle and set up serious and even fatal inflammation.
4. They may become malignant in character.
5. And lastly, they may become a serious obstruction in pregnancy, as occurred in the two following cases in my own practice.

Case No. 1. About seven years ago the writer was engaged to confine a lady in her second pregnancy, she being at the time in the third month. When five months had passed, her attention was called to a rather large tumour in the right upper abdomen which resulted in my being called to visit the patient. Examination revealed a tumour about the size of a cocoanut, which was so movable it could be pushed to the left side, up under the lower right ribs, or into the lower right abdomen. The uterus could be distinctly outlined as a separate mass just below the umbilicus. A tentative diagnosis of dermoid ovarian cyst was made. On opening the abdomen I found the tumour had suddenly disappeared, but on inserting the hand and passing it up under the lower right ribs it was found and drawn outside the abdomen. Examination showed it to be a dermoid cyst of the right ovary, having a pedicle three or four inches long. It was easily removed, the patient making a good recovery and giving birth at full term to a strong healthy child.

Case No. 2. In December, 1916, I was called one night about eleven o'clock to the General Hospital to attend a patient, a primipara at full term, whom the nurse reported to be having violent and frequent pains with a great deal of bearing down. The membranes had ruptured. The patient, a woman of about twenty, and very small, weighing about ninety pounds, was on the operating table. Expulsive pains were very strong and frequent, but there

was no protrusion of the perineum, and apparently no progress being made. On examination I found a large mass completely filling the pelvic cavity but which evidently was not the uterus. For some considerable time I was unable to find the os. Finally it was located well up in front of the pubic arch. On inserting a finger into the os and sweeping it round the circumference, it was apparent that the growth was external to the uterine cavity. A further rectal examination showed it was also external to the rectum, hence it must be in Douglas's cul-de-sac or in the uterine wall: the former being the much more likely. At this time it was midnight, but two or three other medical men were in the hospital and were asked to examine the case. Various diagnoses were suggested—dermoid cyst being the most likely as the growth appeared to be round and smooth except in one section where it appeared very hard and somewhat uneven, as if bony. The mass was quite immovable. There was but one opinion as to the necessity of immediate Cæsarean section. This I did without delay, she having been already in labour several hours. As the patient was pretty well exhausted, no further attempt was made to diagnose or remove the growth. She made an excellent and uninterrupted recovery. At the end of three months I had the patient again removed to the hospital where I opened the abdomen and found a large dermoid cyst completely filling, and packed down tight, into the pelvic cavity. It was quite adherent to the surrounding tissues. Carefully it was stripped free and found to be a growth of the right ovary; it was then quite easily removed. The patient made an excellent recovery and is now enjoying the best of health.

Each of the two specimens I present to-night for inspection. The first has a mass of hair but no teeth. The second also has a large mass of hair, a large piece of bone in its wall and in this bone are a number of well-formed teeth. Each cyst was filled with fat and a fluid resembling pus but which was simply fat, broken down tissue, cholesterin, etc.

Dr. H. McEwen, medical inspector of the schools in British Columbia, reported that the health of the pupils is satisfactory. Since the beginning of the year he has made 1,925 inspections out of a total school population of 2,412; in March he made three hundred and seventy-five physical examinations. The school nurse reported that in March she made twenty-three house visits and gave four hundred and seven treatments and dressings.

National Mental Hygiene

THE ORIGIN, ORGANIZATION AND SCOPE OF THE CANADIAN NATIONAL COMMITTEE FOR MENTAL HYGIENE

By Evelyn Molson Russel

Member of Canadian National Committee

DESPITE the very great advances made in medical science of recent years, how many of our practitioners in Canada to-day realize that an approximate 75 per cent. of the inmates of our jails, about 50 per cent. of our juvenile offenders, from 75 to 80 per cent. of our prostitutes, and a goodly percentage of our cases of pauperism, non-employment, illegitimacy and intemperance are really cases for our medical men, rather than for our judges and their courts? Nine years' work of the National Committee for Mental Hygiene in the United States is presenting us with startling statistics to this effect. To all thoughtful workers in social and philanthropic reform for many years past, there has been the realization that they are pruning the dead branches only, when the trouble really lies at the root, that a thoughtful protective care of the roots would soon result in a great improvement in the general health of the wide-spreading branches of our social life. This is the *raison d'être* of our new Canadian National Committee for Mental Hygiene, an organization which will coördinate the efforts of modern psychiatric science and social service to search out the mainsprings of disease and treat them, rather than working on as has been done in the past, working from the outside inward, and treating the symptoms rather than the disease itself.

It is impossible in an article of this length to deal with all the phases of the work already accomplished or to be aimed at by the American Committee, nor to refer personally to the many eminent men who have done so much towards the success of its undertaking. I have endeavoured to make as accurate and comprehensive a sketch of its history and work, and of our own new Canadian

development as has been possible in the present space, and from the material I have had at my disposal.

The National Committee for Mental Hygiene in the United States, the pattern for our new organization, had a most interesting origin, which is intimately bound up with the life history of Mr. Clifford W. Beers, a man who some eighteen years ago had personal experience as a patient-inmate of various state institutions for the insane. He came out of his three years' confinement in 1903, not only sound in mind and body, but with a clear remembrance of all his experiences and with the definite purpose of exposing the existing conditions under which he had himself suffered, with the object of securing their reform. His first step was to re-establish himself as a normal individual in the business world, and he did this effectively by working successfully for a year and a half for the same firm with whom he had been previous to his illness. Having thus proved his mental stability and power, he proceeded to write his experiences. While yet in manuscript, he sent proof copies of his book to various men, leaders in education, mental study and social and philanthropic work, chief among whom were, fortunately for the success of the undertaking, Professor Adolf Meyer, then of Ward's Island, New York, and now Director of the Phipps Psychiatric Clinic at Johns Hopkins Hospital, Prof. Wm. Welch of Baltimore, and Prof. William James of Harvard. Dr. William James gave him a letter of appreciation attesting the psychological value of his book,* which resulted in its immediate publication by Longmans Green & Co., who have just brought out a fourth revised and enlarged edition. The book created a profound impression as an accurate descriptive statement of the mental history of an individual during the stages of an acute psychosis, as well as conveying definite information about numerous abuses in the care of the insane which demanded remedial action. Dr. Adolf Meyer, whose profound knowledge of the scientific, medical, and social problems involved in the prevention and treatment of early psychoses had long been recognized, received Mr. Beer's information and his book with the consideration which was their due, and directed his efforts into constructive channels. To Dr. Meyer we also owe the happy term "Mental Hygiene." No matter how widely its activities spread in mental fields, the committee cannot outgrow the expression of its aim. Its work has been a great movement towards the co-ördination of

* A Mind that Found Itself.—By Clifford W. Beers. Longmans Green & Co. 4th Edition, 1917.

existing efforts, not only in asylum reform, but also in preventative work in insanity and in the investigation of the mental factor in crime, prostitution, and the various other social evils which come under its scope. One of the great elements in its success has been the appointment of Dr. Thomas W. Salmon as medical director. Dr. Salmon had served for several years as officer of the United States Public Health Service, had been a member of a medical staff of a State hospital and later chairman of the Board of Alienists of the New York State Hospital Commission, and his wide experience and great ability has enabled him to place the work on an effective basis. The Rockefeller Foundation has also been a most potent influence in the committee's work, through its moral support and liberal contributions. It has also conducted many surveys relating to the insane and feeble-minded, has made statistical studies, demonstration studies in the psycho-pathology of crime, and has also done special war work—all in co-öperation with the National Committee.

Dr. Salmon's work also shows in the influence brought to bear on the organization of the Medical Corps of the American army, so that no American soldier enters the army without a mental examination forming a part of his medical tests. This will undoubtedly reduce the vast number of "shell shock" and other mental cases which have been a burden in our army, recruited as we were at the first plunge into war, with no time or experience to appreciate the great importance of the mental fitness of our men. An increased number of psychopathic wards in connexion with various hospitals where cases of simple depression and other nervousness may be dealt with in the early stages and more serious mental illness be thus prevented, the wider establishment of psychiatric clinics in connexion with jails, juvenile courts, etc., are also said to be due to the efforts of the American National Committee towards education and creation of public opinion in these directions.

Though much special work along many of these lines has been done in various individual groups in Canada, it is to Dr. Clarence M. Hincks, of Toronto University, that we owe the co-ördination of effort which has resulted in our new Canadian National Committee for Mental Hygiene. His was the vision which, having a keen appreciation of our needs in Canada, combined a power of organization with unusual energy and enthusiasm. Learning of Mr. Beers' work and the National Committee of the United States, he set to work to rouse the public interest in the need for such a

work in Canada. Leading men from all parts of the Dominion have taken up the work with interest and Dr. Hincks has the gratification of feeling that a work so auspiciously begun cannot fail to succeed.

At the organization meeting in Ottawa, on April 26th, a provisional constitution was adopted—practically a slightly altered copy of that of the United States. The personnel must consist of one third medical men, one third non-medical, the remaining one third being unspecified. The non-medical third must include a good proportion of sound business men, educationalists, philanthropists, and social workers. The right man has been put in the right place when Dr. Hincks was unanimously elected Secretary of the Canadan Committee.

The committee is being financed at its start by private subscription, $75,000, or a budget of $25,000 a year for three years being necessary. Of this, some $50,000 has already been subscribed. It is not too much to hope that in time our committee, working on so truly national a question, shall receive not only the national moral support which it deserves, but also the financial support of the country through its representatives.

The strong bearing that insufficiently restricted immigration, alcoholism and venereal diseases, have upon the mental health of the nation, make these subjects of vital importance to the Committee. Some statistics, drawn from reprints distributed by the National Committee of the United States, show us what their experience has been and offer us a foundation upon which to work.

In immigration, the laws of the United States in 1875, excluded none but criminals and prostitutes, in 1891 idiots and insane were debarred entry, in 1903 epileptics were added to the lists, and in 1907 the great danger from imbeciles and the feeble-minded was sufficiently realized to cause them also to be refused entry into the country. The study and understanding of them has also increased, and from the statistics given by Dr. L. L. Williams, chief medical officer, Ellis Island, N.Y., we find that instead of a yearly average of 120 feeble-minded excluded during the years 1908–1912, there were 483 turned back in 1913. The regulations regarding deportation have also been made much more effective. That those suffering from mental trouble within two years of landing in the country might be deported, did not give a long enough period to protect the country's interests. The two-year period was changed to three years, and again in the last year or two it has been extended to five years. In 1913 on the two-year basis there

would have been two hundred and twenty-two deportations from the New York State hospitals alone. As a matter of fact, the three-year ruling was in force, and three hundred and ninety-nine were returned to their native countries. Now if the five-year basis had been in operation, six hundred and six cases would have fallen under its ruling. We, in Canada, still work under the two-year limit.

Robert deC. Ward, in the *Institution Quarterly*, official organ of the Public Charity Service of Illinois, states that in 1900, 20⅞ per cent. of the total population of the country was foreign born, whereas the foreign-born proportion in insane asylums was 34 per cent. Other statistics show that foreign-born mothers bear two children to every one child born to a native-born mother. The danger suffered through immigration leakages is thus forcibly presented to us. Now, in 1912, there were only twenty-one medical officers in the Public Health Service at Ellis Island. Four or five thousand immigrants a day passed through their hands for inspection, which Dr. Williams states allowed exactly eighteen seconds for each primary inspection! Eighteen seconds in which the doctor must decide whether the individual was fit for admission into the United States! Because if passed on this first inspection, an alien excapes all further examination. The cost per head in 1911 came to sixteen cents. I quote from Dr. Salmon: "The pay and allowance of twenty additional medical officers of the Public Health Service with special training in psychiatry, for duty at American ports, would be about eight cents for each immigrant examined." Another great leakage is in children under five, as only idiocy and imbecility are quickly recognizable at that early age. Through lack of any medical history of parents, etc. (often their only means of deciding the probable fitness of the child), many mentally deficient children are passed by the inspectors.

Many reforms are suggested in the States, for example: an examination of prospective immigrants before they break up their homes in their native land—the raising of the head tax and employment of increased funds in enlarging the staff of medical officers—the placing of a medical officer on board ship so that he may study the immigrants during the voyage, and discriminate more readily between desirables and undesirables on arrival in port.

At Sing Sing, through the psychiatric clinic, it was found that of six hundred consecutive admissions in nine months, 66.8 per cent. had already served one or more terms in prisons or reforma-

tories. Of these 59 per cent. showed mental or nervous abnormality, in that 12 per cent. were insane, 28·1 per cent. were mentally defective, and 18.9 per cent. were psychopathic. 75 per cent. of the total six hundred were mentally abnormal.

In connexion with our Canadian immigration, Major J. D. Pagé, chief medical advisor of the Port of Quebec, states frankly that "If the character of the examination of the immigrants was what it should be, or what it already is in the United States, they would not have found last year (1914) at the clinic for the feeble-minded of the Toronto General Hospital, two hundred and twenty-two feeble-minded persons born outside of Canada, against two hundred and three native born." He shows that his staff is too small, too poorly paid, and not sufficiently scientifically trained to cope efficiently with the work. "The Immigration Medical Service being only a side line for the port inspectors who live chiefly from their private practice, it is nothing but natural that they take very little or no interest in it outside the inspection rooms. They go to the ships according to a system of rotation which cannot always be adhered to on account of their being engaged somewhere else when wanted, so that occasionally four or five of them have to be called before you can get the number required. You will agree with me that under such conditions no earnest training for this very special and difficult work of necessarily rapid inspection can be obtained." In the United States they have calculated that "the expense saved to the State by the rejections at the time of examination was greater than the compensations paid to the physicians of the immigration service." We must be ready in Canada for a large flow of immigration after the war, whenever that day may come, and we must see to it that the failings of the past are remedied in advance and that an adequate and well-trained staff be in readiness. "Though no head-tax is imposed on European immigrants, every Chinese immigrant to Canada must pay $500 to enter. The collections from this source alone, during the years 1911–12, 1912–13, 1913–14, amounted to $9,217,500 against, during the same period, a total expenditure for immigration of $3,834,899.95, thus leaving in the treasury a net benefit derived from immigration of $5,382,600.05. Surely no one should find fault if part of this clear revenue was used for the purpose of reforming the Canadian Immigration Medical Service."

The question of compulsory education and a psychiatric examination of every child, with a following up segregation of backward and mentally deficient children, would reach the evil in its

early stages and before the individual could propagate further of its kind. The establishment of farm colonies where the mentally deficients, wherever found, could be placed and segregated, must also be considered.

The close relationship between alcoholism and syphilis in mental disease and abnormality is now well recognized, and that syphilis brings so frequently to the patient an insanity in later life, and to a large proportion of the children of the diseased, mental deficiency or abnormality of some type. Dr. Gordon Mundie recently stated to a gathering of social workers that not until syphilis became a disease reportable by law just as scarlet fever, smallpox, and diphtheria, would we begin to cope with the disease and its dire results. Dr. C. K. Clarke, Dean of the Medical Faculty in the University of Toronto, gives his views as follows:, "As Superintendent of the Rockwood Hospital for the Insane at Kingston, and later the Provincial Asylum in Toronto, I had an opportunity of studying the problem of insanity in its various phases. For the last four years it has been my privilege to conduct a Psychiatric Clinic at the Toronto General Hospital and to investigate through this avenue well over three thousand cases of mental deficiency and insanity. The latter study has revealed an alarming state of affairs. Our clinic records show, for example, that 51 per cent. of all cases of mental abnormality examined have come to us from countries outside of Canada. This fact alone demonstrates that no adequate means have been adopted at our ports of entry to prevent the feeble-minded and insane from entering the Dominion. Our studies in connexion with juvenile delinquency are enlightening. We have investigated twelve hundred and seven cases from the Toronto Juvenile Court who were mentally deficient. Of this number seventy-two set fire to buildings, one hundred and fifty-eight committed acts of bodily violence, six hundred and twenty-four were convicted of theft, two hundred and seventy-eight were guilty of acts of grave immorality. These cases are for the most part still at large in Toronto because of lack of accommodation in any State institutions for their care. I have been impressed by the close relationship that exists between the problem of venereal disease and mental deficiency. A mental examination has been made of several hundred prostitutes in Toronto, and 75 per cent. were found to be feeble-minded. We cannot hope to cope with the vexed problem of the spread of venereal disease unless defective immigrants are barred out of the country, and farm colony accommodation is provided for those living in the Dominion."

The committee expects to be of great assistance in dealing with the question of the mentally abnormal soldiers who have returned to civilian life, and high medical authority in the army has stated that much valuable help can be given. The need of wide popular education on these questions of mental importance, will also receive attention. It is of great importance that our medical men should have a clear understanding of the early symtoms of mental derangement, so that a specialist's care may be secured before the symptoms become too fixed. And in this connexion attention has been drawn to the great need for a wider psychiatric training to be included in every medical student's course just as thorough as that which he receives in surgery and clinical medicine.

These are some of the problems, far-reaching in their scope, which the Canadian National Committee are anxious to tackle, but their work can only be thoroughly effective through the co-operation of every intelligent person in our midst. Much of their effective work will be done by making surveys of institutions and organizations whose work involves these problems, and of securing statistics to present to the public to prove the need of reforms. Such surveys by trained workers can always be obtained without cost by writing to Dr. Clarence M. Hincks, secretary of the Canadian National Committee for Mental Hygiene, and it is hoped that full use will be made of this organization.

All honour to the men of science and to the philanthropists who have worked so efficiently together and who have given of their best in organizing and promoting this great national movement, among whom must not be forgotten, the man who unveiled his history to be so effectively used by them, and who mortgaged his own energies and means to the same noble end. The seed of this good work has taken strong root in the States and born good fruit. We hope to share in the harvest. But its results are still farther reaching than this. As a direct result of American effort through Dr. Salmon, medical director of the American National Committee for Mental Hygiene, there is a movement afoot in England to-day to establish just such a work over there. It is felt, too, that France is ready to follow closely on their lead, and enquiries have already been received from South Africa and Japan, where there is also thought of organizing a similar effort.

The task and aims of the Canadian Committee cannot be better expressed than in the words of Dr. Lewellys F. Barker, president of the American Committee: "The committee hopes

by investigation, by education, and by organization steadily to improve the brain-power of the nation. It is striving to hasten the time when our people will be so begot, and so reared, that their minds will develop normally and harmoniously; when society will have less need than now for sanatoria, asylums, and prisons; and when all but an irreducible minority of those born to membership in the nation may think, feel and act in a way that will make them desirable citizens of that Better State which is our goal."

Personnel of Committee

The Committee consists of about one hundred and twenty-five members, from among whom the office bearers have been elected, as follows:—

President, Lt.-Col. Charles F. Martin, M.D., Montreal; Vice-Presidents: Lord Shaughnessy, Montreal; Sir Vincent Meredith, Montreal; Sir Lomer Gouin, Quebec; Sir Robert Falconer, Toronto; and Sir William Peterson, Montreal; Treasurer (subject to his acceptance), Sir Edmund Osler, Toronto; Executive Committee: Lt.-Col. Colin K. Russel, Montreal, Chairman; Major J. D. Pagé, Quebec; Professor Dale, Montreal; Lt.-Col. Vincent Massey, Toronto; Dr. C. A. Porteous, Montreal; Dr. Peter Bryce, Ottawa; Dr. C. J. O. Hastings, Toronto; Dr. W. H. Hattie, Halifax; Professor Peter Sandiford, Toronto; and Lt.-Col. C. F. Martin; Medical Director, Dr. C. K. Clarke, Toronto; Associate Medical Director and Secretary, Dr. C. M. Hincks, Toronto; Board of Directors: Lord Shaughnessy, Lord Atholstan, Sir Vincent Meredith, Sir William Peterson, Hon. Smeaton White, Col. H. S. Birkett, Lt.-Col. C. F. Martin, Lt-Col. Colin K. Russel, Professor Dale, Miss Helen Reid, Dr. T. F. W. Burgess, and Dr. F. G. Devlin, all of Montreal; Sir Robert Falconer, Sir Edmund Osler, Lady Eaton, Lt. Col. Vincent Massey, Dr. C. K. Clarke, Mrs. D. A. Dunlop, Dr. C. J. O. Hastings, Mrs. H. D. Warren, Dr. Helen MacMurchy, Mrs. A. M. Huestis, Mr. W. D. Gwynne, and Mrs. J. B. Laidlaw, of Toronto; Sir Lomer Gouin Sir William Price and Mr. Frank W. Ross, of Quebec; Sir Augustus Nanton and Dr. Shorton, Winnipeg; Sir George Burn, Bishop Roper and Mr. C. A. Magrath, Ottawa; Lt.-Gov. Brett, Chief Justice Judge Harvey, E. F. Murphy and Mrs. Nellie McClung of Edmonton; Lt.-Gov. Hon. R. S. Lake and Hon. W. M. Martin, Premier of Saskatchewan, Mr. T. H. Wills of Hamilton.

Editorial

MEDICINE AND DEMOCRACY

THE address of President Morton of the Ontario Medical Association, published in this issue, is an admirable one in every respect. It presents a clear statement of the actual needs of the profession and the aspirations which should animate every member of it in the Dominion in general, and in Ontario in particular. No more apt and inspiring watchword could be urged on our profession than that of "*SERVICE*". The ideal which it represents is preëminently a product of the Christian era and has, for the medical profession, a peculiar and special significance at a time when every standard and aim of our Christian civilization is being challenged and assailed by a barbarian appeal to force. The whole address is conceived in a lofty spirit and can scarcely fail to stimulate everyone it reaches to greater zeal in the discharge of professional duty and all that implies.

The Hamilton men are to be commended for their courage in undertaking the bold project of a joint meeting of all the Medical Associations and those akin to them. The present, with its stress and strain, renders it peculiarly appropriate for the launching of such combined effort, not only to conserve energy, but also to make it possible to exercise a greater influence on the grave problems which confront us, by the increased force with which such influence can be brought to bear on them.

At no period of its history would it have been so possible to rouse the profession to the realization of the need of concentrated action in the interests of the public as well as of their own. It required a great national issue, such as is created by the menace now facing this, as well as all the nations of the world, to rouse the people generally to the

importance of the problems to be met and solved in the near future. Few, if any, difficulties will be more intricate than those to be dealt with by the medical profession.

In the past none of the Associations have spoken for more than a small proportion of the profession, so that their efforts were nullified to a great degree. An Association speaking for the country at large should carry such weight that its mature judgements on all problems affecting the physical well-being of the people should secure the support of an overwhelming public opinion. The real interests of the profession and public are identical. It will require much education of both profession and public to enable either of them to realize it. Had the profession realized its responsibilities and appreciated its privileges, the efficiency as well as the status of physicians in general would be better. They would have been the leaders of movements for combatting the spread of tuberculosis and the systematic and efficient care of those infected as they were in the case of typhoid fever, in place of permitting it to fall into the hands of laymen, who, however well-meaning, are, of necessity, incompetent to realize the intricacies and ramifications of the question. In regard to venereal diseases, they have given a good lead to the public in dealing with it. If the problem is to be effectively solved, the profession must stimulate the Canadian authorities to grapple with it in a manner in keeping with its importance to the life and health of the people as a whole. In the United States a large scheme is being evolved, embracing all societies available, to aid in the prosecution of the work. Can our officials not be prevailed upon to do likewise?

Of the questions to be solved there is none more important or difficult than that of Medical Education. Some of the strictures made on the matter in the Report of the Royal Commissions are quite just. None recognize the need for reform and improvement more than those engaged in carrying on the work in the Faculties in the several Uni-

versities. The solution of the difficulty cannot be reached by them alone, even though they give their undivided attention to the work of instruction and investigation, as at least a majority of them should be required to do. To be completely satisfactory, the education in the home, and in the primary and secondary schools must be greatly improved. The boys and girls must be taught that the ability to *observe*, to *reason* and to *apply the results of their thought* is of more importance than passing written examinations, success in which depends so largely on *memory*. This means that teachers must be better trained and better paid, and have fewer pupils for whose education, in the true sense of the term, they are responsible.

With the President's aspirations regarding post-graduate work we are in full accord. Many attempts have been made in the several Universities to establish such courses, but without success, as sufficient support was not accorded, even by those making request for them. In its broadest sense, post-graduate work begins at once with each after his or her graduation. Doubtless, insufficient emphasis has been laid by the instructors on the importance of the continuance of the methods in the wards in the work of daily life. It is by those who continue these methods that the need of post-graduate work in hospitals and laboratories is duly appreciated. If the officers of the various associations discussed this matter with those in charge of University work an understanding could, no doubt, be reached and a scheme of work evolved. Without effective aid from the practitioners themselves the professors and their associates can do little.

The President has indicated the problems and the aims; the insight and the energy of his associates in the organization of the combined meeting have provided the machinery and the leading for clear definition and appreciation of the difficulties and their solution. Great and good results will certainly be accomplished if the excellent work

done for this meeting is promptly and vigorously followed up by the profession throughout the country working in and through the local organizations.

ASSOCIATION OF AMERICAN PHYSICIANS

AN honour has been paid to Canadian medicine in the election of Dr. Alexander McPhedran as President of the Association of American Physicians. Membership in the Association may be regarded as the "blue ribbon" of medicine in North America. The membership is limited and the Association has always endeavoured to choose its members from those who are doing the best work in medicine. It has often shown an almost uncanny foresight in the election of younger men. It is a society in which "pull and influence" in attaining membership have been conspicuously absent. As Sir William Osler said in his Presidential Address in 1895: "In selecting members we *have* asked whether a man has done good work, rarely anything else, never whence he came."

Dr. McPhedran is the third member of the Canadian profession to be elected President of the Association; the late Dr. James Stewart and Dr. J. G. Adami of Montreal were the others. The Association has always recognized the Canadian profession generously and there are ten members—of a total of one hundred and fifty—who are resident in Canada. It is a coincidence that the two active members lost during the year—Theodore Janeway and John McCrae—died of the same disease and at the same age.

It is not necessary to speak of Dr. McPhedran's position in Canadian medicine. For many years he had been the head of the Department of Medicine in Toronto University and is recognized as a leader in the Canadian profession and as standing in the front rank of teachers. We may quote one of his former students who said: "I have listened

to many teachers of medicine both on this continent and abroad and have yet to hear one who is a better teacher of students than Dr. McPhedran." We extend congratulations to Dr. McPhedran on the honour which he has received.

CANADIAN NATIONAL COMMITTEE FOR MENTAL HYGIENE

IT will be gratifying to the medical profession to learn that there was organized in Ottawa, on April 26th, a Canadian National Committee for Mental Hygiene. Dr. C. K. Clarke, the Medical Director of the Committee, stated the aims of the new organization, which will deal with the vexed problems of crime, prostitution, pauperism, and unemployment; problems in which mental factors are of primary importance. It is hoped also that this organization will be able through its influence to be of assistance to the country in solving some of the difficult problems connected with the return to civil life of the mentally abnormal soldiers, as well as those raised by immigration.

Articles giving additional information of interest, contributed by Mrs. Colin K. Russel, a member of the National Committee, and Dr. C. A. Porteous, Assistant Superintendent of the Protestant Hospital for the Insane, are being published in this and the next issues of the JOURNAL.

There doubtless has never been a time when the problems of applied psychiatry have been so urgent to the nation. There never has been a time in which the nervous systems of individuals have been so tried, and never have we realized as now in this world struggle the practical importance of the social problem in hygiene, and the need of well organized consideration of all the factors that concern society.

In the case of the prospective recruit and of the returned soldier, the tests of mental deficiency have amply

revealed to how great an extent a proper application of the study of psychiatry is required in our state. The efficiency of the social service organizations, the industry of the child welfare organizations, and the far-reaching activities of the National Committee of Mental Hygiene in the United States, have already indicated how much can be done, and how much is *yet* to be accomplished.

The institution of a National Committee of Mental Hygiene for this country is a great need. Not only for its economic value, nor alone for its beneficial effects in the already established institutions for mental defectives, but most of all will its usefulness be felt in the education of intelligent people throughout the country as to the importance of this problem for the whole country. That millions of dollars are being uselessly spent and wasted in the custodian but unscientific care of the insane, is already admitted, but how little has been accomplished to improve these conditions needs yet to be demonstrated. Intelligent people need to be awakened to the fact that a great lethargy exists among the public on these questions, and it is to be hoped that the establishment of this national committee will have such far-reaching results that it will gradually gain increasing support from the States, the cities, and the prople individually.

The Canadian National Committee is to be congratulated in securing as members individuals prominent in medicine, law, education, finance, and social service. Credit for this splendid accomplishment is due not only to the secretary, Dr. Clarence M. Hincks of Toronto University whose perception of the national necessity, and indefatigable efiorts have done so much to co-ordinate the efforts of others, but also to Lieutenant-Colonel Colin K. Russel, M.D., Lieutenant-Colonel Chas. F. Martin, M.D., Major J. D. Pagé, M.D., Dr. Peter Bryce and Judge T. E. Murphy. Lieutenant-Colonel Russel, Montreal, consultant in neuro-psychiatry to the C.A.-M.C., has familiarized himself with those military problems in

which mental abnormality was a factor, and he believed that a National Mental Hygiene Committee could help the Army in this sphere. Colonel Russel prior to the War had advocated mental examination of school children. He had felt keenly the need of psychopathic departments in connexion with the general hospitals in Montreal, and had urged their establishment as well as the more thorough grounding of the medical student in this special study during his undergraduate course. Since the Committee endorsed progress along these lines, he gave it the benefit of his hearty support in Montreal with gratifying results. Major Pagé, respected and beloved by French and English alike in Quebec, has long been dissatisfied with the inadequate medical examination of immigrants. On the public platform he has time and again deplored the fact that through loose methods at our ports we have been allowing thousands of insane and feeble-minded aliens to enter the Dominion. On these and other grounds it was natural that Major Pagé should welcome the new organization, and was instrumental in securing the coöperation of the foremost citizens of his city.

We wish the Canadian National Committee all success. It is inspiring to see medical men and leaders in finance working together in such an important field of endeavour. The Committee will find much that needs to be done in Canada. Our existing state institutions for the care of the insane and feeble-minded are overcrowded and many who seek admission are turned away. We need additional hospitals for the insane, farm colonies for the feeble-minded and psychiatric departments attached to our general hospitals. Canada would do well to build and equip several institutions similar to the Phipps Institute at Baltimore where research in connexion with mental diseases could be carried on. Our knowledge concerning many of the psychoses is indeed meagre, and if we would prevent mental breakdowns, if we would check early cases of dementia præcox for example, then more time and thought must be given by the medical

profession to psychiatry, and the interest of intelligent men and women must be directed to the conservation of the mental health of the race by developing the qualities of foresight and judgement. The Canadian National Committee for Mental Hygiene can do much in a field too long neglected.

THE ADMISSION OF WOMEN TO THE STUDY OF MEDICINE AND ALLIED SUBJECTS AT McGILL UNIVERSITY

ON Friday, May 10th, the Corporation of McGill University admitted women to the study of medicine by adopting in full the following resolution which had been sent forward from the Medical Faculty: "That the Faculty recommend to Corporation that women be admitted to the study of medicine provided they had taken a degree in Arts from a recognized University; or that they take the double course of B.A. and M.D., or B.Sc. and M.D. at McGill University; or that they have completed the first and second year in the Faculty of Arts at McGill University, and thus give evidence that they are sufficiently mature and otherwise qualified to take up the study of the professional branches. The Faculty further recommends that inasmuch as in certain subjects, separate laboratory accommodation and equipment are highly desirable, a strong appeal be made for some addition to the available funds of the Medical Faculty."

At the same meeting of Corporation a letter was presented from two Montreal nurses asking that provision be considered for a University course of Nursing Instruction for graduate nurses, along lines similar to those followed in Columbia University, New York, and pointing out that nurses are now forced to go to the United States to obtain these advantages. This suggestion was received with sympathy by the McGill Corporation, and we understand that the matter has since been taken up by the Medical Faculty, and that

provision for courses of instruction for nurses in anatomy, physiology, and materia medica for next session, is now under consideration, other courses being left to the hospitals to provide, so that the immediate future is likely to see a Teachers' College for Nurses at McGill an established fact.

A new department for Social Service and School for Physical Training for *masseuses* have also been inaugurated recently at McGill as stated below. Thus, within a few weeks, a professional training in medicine and in at least two, in all probability three, of its ancillary sciences has been provided for women, and the doors of the most conservative of Canada's great universities are now thrown open without distinction of sex.

This event is the logical outcome of the entrance of women into the Arts Faculty, and the University has been slowly broadening her phylacteries to meet the needs of her women students and graduates. It is just thirty years ago this spring since the first class of women graduated in Arts from McGill. It is a far cry now from the days of Florence Nightingale, seventy-five years ago, and the mid-Victorian standards of her time, when the only possible sphere of women's work was asserted to be the home, The advance has been slow. The splendid work, however, done by women towards the winning of the War is at present in every eye, and has undoubtedly been the most important element of all in the change of thought that has carried woman and her work so rapidly into the van, and given her usefulness and recognition. In the organized application of our Red Cross industries, the productiveness of the British Ammunition factories, the splendid achievements of the Scottish Women's Hospitals in Serbia and France, in the good work accomplished by the *chauffeurines* of the Western Front, and last but not least, in the clear-sighted administration of our Canadian Patriotic Fund itself, are presented evidence incontestable of the value of the services that a woman has to render to her country as well as to her home. The hearty

appreciation of the value of these services has been shown in many ways, but one of the most striking is certainly the throwing open, within the last two years, of the doors of medicine in practically all the great universities of this continent, Pennsylvania, Chicago, Columbia, Winnipeg, McGill, Yale, and others following the example set by the Johns Hopkins Hospital, Toronto, Michigan, and Cornell.

The educational restriction placed upon women entering the study of medicine at McGill to the effect that they must have a B.A. degree or two years in Arts at that university, may seem a hardship, but in them is to be clearly read the desire of the Faculty to secure a class of mature students who will do high honour to the profession of which they are made free. The profession will look for great accomplishments from its women graduates.

THE REPORT OF THE COMMISSION UPON MEDICAL EDUCATION IN ONTARIO.

THE report of the Royal Commissioner on medical education is at last available for the inspection of the favoured few. The government has not thought fit, for the present, to print it, although promises are held out indicating that in the near future it will be made public. The osteopaths who have seen it seem dissatisfied, the chiropracters are more than dissatisfied, and the Christian scientists find it anything but satisfactory; however, if Christian Science is a condition of mind, why should they worry. Undoubtedly the Commissioner, who appears to have discovered that the subject of medical education is somewhat complicated, even for the legal mind, has produced a report that does him credit. It is an admirable report to be made by a layman, and the Commissioner may be thankful that he has been given a free hand in steering his bark past the Scylla of the "regular" physician on the one hand, and the Charybdis of the quack on the other. At first reading it appeared as if he were try-

ing to appease the righteous wrath of the osteopath by advocating far greater attention to physical therapy than has been given in the past, but a careful reading of the report makes it clear that he has the treatment of the returned soldier in mind. To a certain extent his contention is correct, although he probably overestimates the benefits likely to result from extensive training along these lines. Those who know how the Zander room fad has fallen into disrepute will understand what is meant by the above statement.

There is little comfort for the Ontario Medical Council, and the Judge has put his finger on the weak points very deftly and yet upholds the right of the Council to exist, as was inevitable. The suggestions regarding the reduction in the number of the members is what all sensible men believe to be correct, and the remarks about the financial standing of the Council must prove unpleasant reading to those of that body who have regarded the Council as existing to help them to enjoy life at the expense of the poor student. The suggestion that an unjustified surplus be handed over to the Provincial University to enable it to forward medical education, has a touch of humour in it that was unsuspected by those who saw the stern-faced Commissioner at work, and yet the suggestion is not without point. The Medical Council would do wisely to reorganize itself before it is forced by the Legislature to do so.

The Commissioner, wisely, no doubt, is not inclined to allow the Universities to grant a license to practise without some sort of supervision by the Council. While the Provincial University should, at least theoretically, have this right, at the same time no end of trouble would result if one institution alone received this privilege. Under the circumstances the University of Toronto is little likely to protest, as the Commissioner pays high tribute to its organization and efficiency.

The Commissioner in his report touches the inconsistencies of the profession at various points, just as the medical

profession might do in the case of law, if it were given the opportunity; at the same time there is a great deal of truth in much of his criticism.

Now that the report is on the table, the question naturally arises, what is the Government going to do about it? let the document find its way into a pigeon hole, or blossom forth into sensible legislation that will put the unmitigated quack in the place he rightly should occupy and so keep medicine on the level to which it belongs, or throw a sop to the bogus scientists whose ignorance has always threatened the safety of the public?

On the whole, the Commissioner has done wonderfully well, and has produced a document that will be of intense interest to all who are honestly anxious to see medical education in Ontario kept on the highest plane possible.

SOCIAL SERVICE DEPARTMENT AT McGILL.

McGILL University has taken a forward step of the utmost importance in founding a Department of Social Service which will begin work next session. The new department is designed to give leadership and training of university standing in the various branches of the new profession of expert social service. Montreal employs a rapidly increasing number of social workers, but gets them almost entirely from the States. But the majority of the students will be men and women already interested in social work, who look forward to taking part as volunteers or leaders of opinion in some phase of reconstruction.

The Department will devote itself to the study of our social and municipal problems, and should bring the powerful aid of knowledge and experience to the help of the professional and general public. The time is very ripe for a closer integration of the forces that make for social welfare, and that is what McGill hopes the new department

may help to achieve. The Director will be a university man who had business experience prior to his ten years social work in Winnipeg, will bring to it a wide outlook and executive energy and ability. The lectures and classes will be conducted partly in the university by the regular staff, and partly in the field of social work in the institutions of the city. In this regard a hearty coöperation is already assured.

The McGill Graduates Society are making the adequate development of the Social Service Department the object of their special efforts in the immediate future as stated in the announcement published on page 560 of this issue. It is to be hoped that this most laudable undertaking will receive the support that is its due.

Among the various kinds of war service performed by the Universities, one interesting form is the institution of a course of training for masseuses by the School of Physical Education at McGill. The School had already a course in corrective gymnastics as part of its training for physical instructors; for it has always held that the physical instruction of school children must be based on the bearing of exercise on the normal physiology, anatomy and hygiene, and of the most common abnormalities, of growing children. But, on the outbreak of the war the Committee, foreseeing the need, started a full-time eight months course for the training of masseuses.

The year 1915-1916 was spent by the physical director in the war camps and hospitals of England as a member of the Almeric Paget Massage Corps. When she had thus added to her previous training the advantages of a varied experience of the military needs (including five months charge of the remedial work at Rhyl Convalescent Camp) the massage course was extended. It now includes as its main subjects a thorough grounding in anatomy, physiology and hygiene, with the practice and theory of massage and re-

medial gymnastics, and the various forms of physio-therapy. From the first the university authorities and staff, and the hospitals have given hearty coöperation; the clinical facilities have been excellent.

As was expected in founding the course, the majority of the graduates are engaged in military work. One is in charge of the massage department at the Drummond Street Home, and one is on the staff of the Almeric Paget Corps in England. All this year's class of nine have been asked to join the staff of the C.A.M.C. either as demonstrators or masseuses. But the Committee looks forward to the training of masseuses as a permanent contribution of the School to medical service. It is setting a high standard and is working for a registration which shall help to make massage a recognized profession for educated women. In this purpose it looks with confidence for the coöperation of the medical profession.

ANNOUNCEMENT

SPECIAL ANNOUNCEMENT FROM MCGILL GRADUATES' SOCIETY *re* DEPARTMENT OF SOCIAL SERVICE

In the first year of the War the graduates society of McGill University, which had rested in a comatose condition for some years, was revived in connexion with a movement which aimed at maintaining a stable and well informed public opinion in Canada on the subject of the War. This movement later took the form of assisting to raise and in equipping University companies which were authorized and welcomed by the Militia Department, and which afterwards acquitted themselves in such a manner as to become a source of gratification and pride to all McGill graduates. While the military work is still carrying on it is now proposed by the executive body of the society to prepare such a programme for its members to follow as will embrace the best interests of the University itself and at the same time keep before the graduates of all faculties that older and wider conception of citizenship and its relation to the humanities with which the Alma Mater inspired them in days gone by. While the committee were de-

liberating as to the best method of accomplishing this, a message was received from the Principal of McGill University to the effect that the coöperation of all McGill graduates would be welcome in connexion with the support and development of a Chair for Social Service in that newly formed department at McGill. In the last report of the University it is intimated that the study of social problems can only be successfully faced by those who have the capacity for intelligently understanding at one and the same time academic methods and industrial life. Here is an opportunity for the graduates in all faculties and of the Medical Faculty in particular to improve existing methods of applying the laws which ought to govern the arrangements for health, for town planning and housing, education, public recreation, and civic administration. With this programme a very full general meeting of McGill graduates is looked for on Thursday evening, June 13th, at the Royal Victoria College, Montreal. Professor Dale and Miss Reid, of the Patriotic Fund, will address the meeting.

(Signed) MARY H. SHEARWOOD,

Vice-President McGill Graduates' Society.

DR. H. B. ROGERS has just been appointed resident medical superintendent of the Jubilee Hospital. Dr. Rogers was house surgeon at Chemainus Hospital for several years, and subsequently entered into private practice in Victoria. At the outbreak of the war he went overseas and has been engaged at one of the big base hospitals in France until quite recently.

The secretary was instructed to send letters of condolence to two members of the board, lately deceased, Mr. A. Wilson and Mr. Richard Hall, and also to the family of the late Dr. Oswald Meredith Jones. It was further decided that portraits of Dr. Jones and Mr. Wilson should be secured and hung in the hospital.

The institution is in great need of an intern doctor. The young men, as soon as they graduate from the medical schools, are immediately requisitioned for military purposes. The hospital decided to make application through the military authorities for such a graduate to take the place of Dr. Black who had just been appointed to St. Joseph's Hospital.

Obituary

DR. JOHN W. ANDERSON

VERY keen regret was felt on the death of John W. Anderson, the late house surgeon of Victoria Hospital, Halifax. A career of great promise has suddenly terminated and it is a severe blow not only to his relatives and immediate friends but to hundreds who knew him and held him in the highest esteem. He was born in Heart's Content, Newfoundland, twenty-eight years ago. He began his medical course at Dalhousie University where he was a great favourite with all his fellow students who quickly recognized his mental abilities; he was also one of the most popular athletes in the college. During his last summer vacation he was appointed house surgeon of Victoria Hospital and at the special request of the medical board he remained in office. He was to go up for his finals in May, these examinations having been delayed by the disaster in the Nova Scotian capital. As soon as they were over he intended to join the R.A.M.C. This would have been the culmination of his dearest hopes, for only the most urgent representations on many occasions had prevented him throwing up his medical course to enlist in one of the many Nova Scotian drafts going overseas. He was the brother of Dr. Anderson of St. Johns and the son of a physician who lost his life in a blizzard in Newfoundland.

The young surgeon was ill of pneumonia only one week when he passed away. The fact that he had contracted diphtheria, while on duty in the medical wards, last December, is believed to be the cause of his succumbing so quickly to the attack which terminated fatally. The deepest sympathy is extended to his aged mother who survives him, and on whom the blow falls most heavily. The funeral service, held hurriedly prior to the sailing of the Newfoundland steamer, was attended by President Mackenzie, representatives of the Senate, of the Faculty of Medicine, of the staff of the Victoria General Hospital and the students of the University.

Dr. C. J. Kelly, who practised in Hamilton chiefly as *x*-ray specialist for many years, died in Arizona, December 29th, 1917. He had been in poor health for over two years. He graduated from the medical school at McGill University in 1891.

Miscellany

News

MARITIME PROVINCES

The Halifax Medical Society held its annual meeting on April 24th. The president, Professor John Cameron, D.Sc., of the chair of anatomy, was in the chair. The president was reëlected for the ensuing year. Dr. Mader was elected vice-president. The secretary-treasurer, Dr. Hugo Schwartz, was reëlected. The executive council was elected as follows: Dr. M. S. Dickson, Dartmouth; Dr. A. C. Hawkins; Dr. Frank Mock; Dr. F. G. Macdougall and Dr. George K. Murphy. The meeting congratulated Dr. Hawkins who had that day just been elected Mayor of Halifax.

The Public Health Officer of the Provincial Department, Nova Scotia, has just issued his report for 1916. In an estimated provincial population of 507,880, there was a general death rate of 15·8, an infant death rate of 121·6. The general death rate of the cities and towns was 17·6 and infant death rate 164·8. In the rural districts the general death rate was 14·6 and infant death rate 84·1. The year 1916 was the most unsatisfactory they had had for some time the medical officer said. The death rate from respiratory conditions generally was unusually high; there was a sharp recrudescence in death rate from pulmonary tuberculosis; pneumonia claimed an unusually large number of victims also, and measles caused no less than 241 deaths as compared with an average of 46 in the seven previous years for which they had statistics. At the time the report was prepared the vital statistics for 1917 were not available, but the indications are that it will substantially better the year reported on. The death rate from pulmonary tuberculosis will be much lower than in the preceding year. The morbidity returns, which have been summed up for the year 1916–17 (up to September 30th) show a most gratifying improvement over 1915–16. The number of cases of typhoid fever and of scarlet fever reported have, in each instance, been about 35 per cent. less than in the previous year.

A wide spread epidemic of smallpox had been threatened, but

the disease had been, in the main, of a mild type and had caused but one fatality. Altogether forty-nine cases were reported in the province. On the other hand, the fact that the disease had been reported from fifteen localities in eleven counties indicated that no community in the province could be free from the menace of infection, and the report strongly urged that the simple and efficacious preventive measure of vaccination should be universally adopted. The Halifax death rate was the highest of any city or town in the province, but the infant death rate was lower than that of some other localities.

The New Brunswick Legislature has passed the Public Health Act, introduced by the Hon. Dr. Roberts, after much debate and the elimination of certain features of the bill. The principle of the bill was, as explained by Dr. Roberts, to prevent existence and spread of disease. To protect others from persons infected with dangerous diseases. To bring about conditions resulting in the reduction of the death rate of children and others from preventable diseases. Provision of hospital and clinical treatment along most modern lines. To increase the value of life by lengthening it and remove retarding weaknesses. To remove or remedy unhealthy conditions, localities, nuisances. The education of individuals in hygiene and personal care. To study diseases, causes and treatment. To keep accurate records of vital statistics. To insure pure food and water supplies.

The means proposed to make the bill effective were: A government department with a responsible minister. A technical staff having an oversight over the operation of the act throughout the entire province. A division of the province into districts, with a health officer supervising the work in each district. A sub-district board of health responsible for the carrying out of the legislation. Powers given to the department to compel the obedience to the law or the fulfilment of duties. All births, marriages and deaths to be promptly registered with the District Medical Health Officer.

The Women's Institute of Fredericton has asked the city council to appoint a woman as bread inspector and recommended Miss Jean Cooper for the position.

The annual graduation exercises of Prince Edward Island Hospital took place on April 26th. Seven nurses graduated and the diplomas were presented by Mr. Justice Haszard. Mr. Pope

on behalf of the trustees extended to the recipients their heartiest congratulations. He referred to the grand work accomplished by the Prince Edward Island Hospital, and said that though the institution was somewhat in arrears, the equipment was never in better condition. The trustees are organizing a systematic appeal throughout all the rural sections of Queens and Kings counties for the hospital. This institution serves at least 6,000 families. The report of Falconwood Hospital and the Provincial Infirmary is a most satisfactory one from the point of view of efficiency, care of patients and successful management of the farm in connexion with the hospital. The expenditure on maintenance during the year 1917 amounted to $88,466.26. At the close of the year there were 276 patients in the hospital; 91 in the infirmary and 8 in the tubercular cottage.

Seven cases of smallpox were reported in Sydney and three in St. John's, Newfoundland, in the beginning of the month of April.

ONTARIO

Scarlet fever in the province of Ontario is about on a par for April with the three previous months of this year. The Provincial Board of Health statistics show 1,416 cases and thirty-six deaths. Smallpox shows a material reduction, the figures being: January, seventy-nine cases; February, ninety-one; March, forty-seven; April, thirty-nine. Diphtheria dropped from three hundred and ninety-four cases and thirty-two deaths in January last to two hundred and forty-two cases and twenty-two deaths in April. The decrease is attributed to the free distribution of antitoxin at a cost of $1,280. Measles and whooping cough showed a decided increase.

There are seven health districts in the province, each being under the supervision of a medical officer who has undergone special training for that purpose. A special sanitary officer is appointed who has charge of the sanitary conditions in the lumber camps, the mines and railway construction camps. All water and sewage works must be approved of by the provincial board before they are established.

In Toronto, Kingston and London are maintained fully

equipped laboratories, where samples of water, sewage, milk, meat, etc., are examined. Diagnostic reports on diphtheria, tuberculosis, typhoid, paratyphoid fevers and venereal diseases are issued to medical practitioners of the province. For the prevention of the spread of such diseases as anthrax and rabies from the lower animals to man, facilities are provided. All these services are free of charge.

The local provincial boards of health have supplied the medical officers and hospitals, free of charge, with smallpox, typhoid and paratyphoid and whooping cough vaccines, antimeningitis serum, diphtheria and tetanus antitoxins, silver nitrate for the prevention of babies' sore eyes, and Pasteur preventive treatment for rabies. Recognizing the great opportunities for preventing typhoid fever in the Canadian army, the provincial board has supplied, free of cost, all the vaccine used for this purpose. Thus the Department of Militia and Defence have been relieved of an expense of $150,000 to $260,000. There is a practical laboratory instituted for research work in sewage, water and other health utilities. This plant is said by impartial critics to excel any experimental plant of the kind in America. The students of Toronto University are, by special arrangement, given a course of sanitary engineering in this laboratory.

The Llewellyn Maternity Hospital was formally opened on April 24th by Inspector of Hospitals, Dr. Helen McMurchy. This beautiful institution was donated to the town of Oshawa by three companies, the McLaughlin Carriage Company, the McLaughlin Motor Car Company and the Chevrolet Motor Company of Canada, all of which are under the control of the McLaughlin family. The ladies of the hospital auxiliary have furnished it so far without any expense to the hospital board. The people of Oshawa have contributed generously and many small gifts as well as large ones testify to the widespread interest in the undertaking. Dr. McMurchy, in her excellent address at the formal opening, scored a point when she said: "The baby was the nation," and was glad that the people of Oshawa would have such a beautiful place to be born in.

About three hundred delegates, who attended the conference on education held recently in Toronto, attended a meeting in Convocation Hall to discuss the problem of combatting social diseases,

a number of prominent social service workers taking part. Sir Robert Falconer presided. Dr. Clarke, of the General Hospital, and Dr. Gordon Bates gave figures which showed the alarming spread of these diseases. Dr. Clarke asserted that 14,000 cases of syphilis alone visited the hospital clinics for treatment. A startling fact was revealed in the fact that even children of one and a half years had received treatment. About 10 per cent. of public ward patients had venereal disease and did not know it. Dr. Bates stated that about ten per cent. of the troops in the district were infected, but this proportion was no greater than among civilians.

QUEBEC

The Ottawa Maternity Hospital, which coöperates with the three city hospitals in their courses in obstetrics, has a gratifying record. So efficient is the nursing staff attached to the hospital that during the last fiscal year there was not a single maternal death. The present building is too small to cope with the designed scheme of usefulness and the management are planning a public appeal to the citizens to supply this most urgent need of conserving infant life at the most critical period of the world's history.

Dr. Law, medical health officer, has found it necessary to announce, in view of the persistent rumours that have been in circulation with regard to spinal meningitis having developed a considerable number of cases that there was not a single case of the disease in Ottawa. The board of health has decided to take strong measures to arrest the growth of infant mortality in Ottawa. Prosecutions will follow failure to report births within forty-eight hours. Physicians also are required by law to report cases of contagious diseases within forty-eight hours after the case has been determined. The board also decided to instruct the milk station nurses to secure from the Roman Catholic parishes in the city, twice a week, the baptismal registrations.

The government has under consideration the increase of the amount to be paid to animals slaughtered under the operation of the Animal Contagion Disease Act, and a bill to this effect is to be put through the present session of parliament. To this measure an amendment is urgently needed. A prominent breeder of pure bred cattle recently discovered tuberculosis in his herd; the herd

had been built up at great cost and much painstaking effort. He reported to the Dominion authorities and this is his position. He cannot sell milk from the herds; he can not sell animals from the herd to the packing plants, he will get no compensation from the government if he kills the diseased animals, but—he is entirely free to sell these animals to other farmers for breeding purposes and thus scatter infection all over the county. Since the object is to kill out contagious diseases, how does parliament deal with the object in view?

Mrs. Hannington, general superintendent of the Victoria Order of Nurses, speaking of the serious farming difficulties prevalent in the West, said the V. O. N. is about to start a big campaign to send nurses out there to save mother and child life. "The mothers may be foreign but the babies are ours," was her very pertinent remark. Four training schools have been established where graduate nurses may take the course of Public Health Nursing, and a plan is on foot to enable a nurse to combine this four months' course with that of her regular training in the last year of her course in the hospital. All the machinery is available, all that is needed is the coöperation of the training schools and the support of the Union government. About forty graduates of the Lady Stanley Institute have answered the call to overseas duty.

Sir James Grant, of Ottawa, is the only living member of the original Medical Council of Ontario of 1866, and has been present at almost every meeting during the past fifty-one years. Sir James is also the only living member of the Confederation Parliament of 1867.

Dr. C. R. Paquin, the health officer of Quebec, has just issued a very instructive and far-reaching report for 1917, to which a number of others in the public service have also contributed. Much attention has been devoted to the inspection of milk, the sanitary service, the prevention of tuberculosis, inspection of cows, stables, etc., inspection of schools and hospitals. The analysis of the city water and methods used for its purification is comprehensively dealth with. The total number of patients admitted during the year to the Civic Hospital were one hundred and seventy, of these one hundred and sixty-three were cured and seven died. The number of contagious diseases for the year reported to the health officer were five hundred and twenty-nine. The infant

mortality shows a splendid decrease from 1916, when the total number of deaths were 1,421. In 1917 the total number of deaths were 1,070. The city is to be congratulated on the saving of three hundred and fifty-one lives, which is attributed to the enforcement of the milk regulations.

MANITOBA

THE city health authorities are alarmed at the rapid depletion of cattle herds that supply Winnipeg with milk. The herd of cattle that has provided the General Hospital with milk for eight years was sold for approximately $15,000. The board will call for tenders at once for a new supply. The authorities are determined to take drastic measures to protect the general supply and avert a milk famine.

THE annual report of the Winnipeg General Hospital was one of the most encouraging in years. It gave a detailed account of the year's activities embracing the financial statement. This was especially favourable, in view of the extraordinary difficulties the board had encountered in the endeavour not to exceed the current revenue. A grant of $60,000 from the city was made payable in two installments. The total revenue was $417,292; the expense of operating and maintaining $476,507, leaving a deficit of $59,215. The erection of a new psycopathic building will be undertaken, for which the provincial government has made a grant of $50,000. The number of operations in the *x*-ray and hydrotherapeutic department for the year were 22,130, and general operations, 4,387.

SASKATCHEWAN

THE consulting engineer of the Department of Public Health, J. H. Puntin, has recently met the School Board, Regina, in reference to the probable installation of a septic tank to dispose of the city waste.

THE department of agriculture has discovered in one or two sections of the province a very obvious attempt to deter farmers from using formaldehyde on their grain seed this season, thus lessening production and making certain the growing of smutty grain. Rumours were prevalent that German sympathizers had tampered with the supply of formaldehyde for Saskatchewan. The officials of the department at once made a thorough investigation.

The test was made by Dr. G. A. Charlton, provincial analyst, and as a result of the analysis, Dr. Charlton has reported to the department that the formaldehyde is perfectly normal. Professor H. L. Bolley was also instructed by the department to make a test, and he was of precisely of the same opinion as Dr. Charlton. E. A. Lloyd, B.S.A., of the University of Saskatchewan, left immediately to visit districts from whence the rumours have come, to assure the farmers they have nothing to lose but everything to gain by the extensive use of formaldehyde.

ALBERTA

The University of Alberta is giving special classes of instruction to the provincial public health nurses, upon whom, to a considerable extent, rests the development of the health policy. Later on they will take a thorough course in medical inspection in schools which may be taken in the Calgary schools in connexion with the Calgary school medical staff. The Calgary medical inspection is regarded as the most complete of any in the Dominion of Canada. A health exhibit will be put on at the Exhibition which will largely consist of moving picture films.

BRITISH COLUMBIA

The sixth annual meeting of the Graduate Nurses' Association of British Columbia was held on April 2nd, at the Royal Jubilee Hospital. The president, Miss Randall of Vancouver, delivered her annual address. Dean Quainton delivered the invocation. The most important matter brought up was the introduction at the present session of the Provincial Legislature of the Nurses' Registration Bill. The Hon. Dr. MacLean, Minister of Education, is to introduce the bill as a government measure. Most important among the reports was that of the Committee on the organization of a league for National Service. The affiliation of the Canadian National Association of Trained Nurses with the Canadian Red Cross was strongly urged. A resolution was adopted by the meeting that "The Graduate Nurses' Association of British Columbia ask the Provincial Government to make provision for the mentally defective and delinquent children in our province, also for the care of the aged men and women who are not able to care for themselves."

ARMY MEDICAL SERVICES

Promotions in the Canadian Army Medical Service: Colonel J. A. Roberts is appointed deputy director of medicals, and Lieut.-Col. C. H. Dickson, assistant director of medicals, Captain F. B. Woodbury is appointed deputy assistant director of medicals. Surgeon-General G. B. Foster is gazetted a major-general.

Major J. W. McIntosh, M.P.P., a member of the British Columbia Legislature, has been placed in charge of the medical work at No. 2 Canadian Hospital in France. Previous to his appointment he had been a member of the Military Medical Board in London, England, and had been engaged in the military hospitals, but on account of his work as a specialist in diagnosis and internal medicine he received his promotion.

Dr. A. M. Warner, of Vancouver, has been mentioned in the despatches from East Africa for meritorious service in the field. Captain Warner gave up his practice early in 1916 to join the R.A.M.C. He was sent out to German East Africa and shortly after the capture of Dar Es Salaam was given command of the Blue Carrier Hospital. This he built and organized, under great difficulties, into a 1,200 bed hospital.

At the presentation of decorations in Toronto lately, by the Duke of Devonshire, Dr. McEwan, of the 44th Battalion, received the Russian Cross of St. George. Dr. G. B. Carbert received the Military Cross which had been won by his son, Captain M. Carbert, formerly of the 20th Battalion.

The Distinguished Conduct Medal has been awarded to Sergeant J. Turner, who led stretcher bearers under fire with total disregard to personal danger, earning the admiration of all who came in contact with him.

The Military Cross has been awarded to R. S. M.A. P. Disley, C.A.M.C.

Private Harry Brown, C.A.M.C., had the distinction of being one among the honoured dead whose names were recently tabled in the House of Commons on Canada's roll of V.C.'s.

Nursing Sister Wilson (the wife of Major Cameron Wilson, C.A.M.C.), has been awarded the Royal Red Cross.

Dr. Bruce, of Toronto, now with the Imperial Medical Service in France, will be a member of the important British commission that is shortly to visit the United States. It is composed of three prominent surgeons who will attend the National Medical Association at Chicago and other gatherings. Dr. Bruce will represent the body with which he is serving at the front.

Dr. Robert J. McFall will immediately take up the duties of commissioner investigating the high cost of living, in succession to W. F. O'Connor, who has resigned. Dr. McFall is a Nova Scotian. He studied at Glasgow University and Columbia University, taking his doctor's degree in economics at the latter institution.

Major A. Mackay, M.D., of Toronto, has been appointed Inspector of Prisons and Asylums, and Inspector of Institutions receiving aid under the Hospital and Charitable Institutions Act. Major Mackay was formerly in charge of the medical inspection of the public schools in Toronto.

The Military Hospitals Commission Command ceases to exist, as the Depot Unit, under the command of Colonel La Fleche, takes charge of all returned soldiers. Colonel La Fleche will have no connexion with the military hospitals, which are to be conducted by the Army Medical Corps.

Already between sixty and seventy medical students of Toronto University have applied for entry to the R.N.V.R. as surgeon probationers. The naval secretary, J. R. Hemsted, has sent out instructions regarding the course of procedure. Forms of application will be forwarded to those who apply in writing.

A tribute was recently paid to the Canadian and Australian medical authorities, by the British War Office, for generously lending medical officers and nurses. In the late retirement along the Western front a certain number of medical units, such as casualty clearing stations, fell into the hands of the enemy. All the medical and nursing personnel of these units and the patients were safely evacuated, but it was inevitable that in the process of evacuation a number of casualties occurred as the units had to be cleared out at short notice under, in many cases, a heavy fire. The War Office announcement concludes with praise for the un-

selfish devotion and disregard of personal safety shown by all the medical and nursing personnel, and special reference was made to the exemplary work of the stretcher bearers and ambulance drivers. The equipment was replaced immediately and a large reserve of supplies sent to France. The prompt assistance of the Canadian and Australian authorities was greatly appreciated.

Lieut.-Col. Charles H. Gilmour arrived in Toronto from overseas recently. He went to England with the 1st Contingent as a major in the C.A.M.C., and was sent out to No. 2 General Hospital, France. After seeing considerable service, he was recalled to England for duty in military hospitals. He was later attached as chief surgeon at Bramshott Military Hospital, to the Duchess of Connaught Canadian Red Cross Hospital at Taplow, and had command of the hospital for Canadian officers at Broadstairs, on the Kentish coast. For the last eight months he was chief of the surgical service at the Ontario Military Hospital, Orpington. Lieut.-Col. Gilmour graduated in medicine from the University of Toronto in 1903, and afterwards practised in Toronto, where he was on the surgical staff of Grace Hospital.

Lieut.-Col. Fraser, M.D., has returned from the war zone. The doctor was one of the "Original Firsts" to enlist in his district on the opening of the war. He went as a captain in the A.M.C. and has received the D.S.O. for courage in the field in attending to the wounded while under fire. He has been continuously on the fighting line for three years and has well earned his short furlough.

Captain C. Walker, M.D., of Toronto, has returned from overseas. Early in 1916 he joined the R.A.M.C. and was attached to Devonport Military Hospital, England, He went to France in charge of the 61st Field Ambulance Corps. He was some time in hospital with a broken arm, the result of a fall from his horse, and on returning to duty was attached to Winchester Hospital in England. In the fall of 1917 he again returned to France in charge of an ambulance train conveying wounded from the front line to base.

Another Toronto University man has returned on leave, Major William C. Laidlaw, an M.B. of '95. He went through the South African campaign in which he won the D.C.M., and again

offered himself for service in 1914. He was made O.C. of the Sanitary Section of the 1st Division, and quite recently appointed Deputy Director of Medical Services at the Canadian Army Corps Headquarters in France under General Currie.

Book Reviews

AN INTERNATIONAL SYSTEM OF OPHTHALMIC PRACTICE. Edited by WALTER L. PYLE, A.M., M.D. MEDICAL OPHTHALMOLOGY. BY ARNOLD KNAPP, M.D., professor of ophthalmology, Columbia University. 480 pages, with 32 illustrations. Price $4.00 net. Publishers: P. Blakiston's Son & Co., 1012 Walnut Street, Philadelphia, 1918.

IF proof were needed, one would find in a work of this kind irrefutable evidence of the indissoluble relationship between ophthalmology and general medicine; for a work on medical ophthalmology is essentially a compendium of general medicine with special reference to eye changes.

As one would expect, Knapp has done his work in a thorough and acceptable manner; and, while a treatise of this kind must of necessity be of the nature of a compilation, it yet bears the impress of the author's clinical assiduity in fields rich in material. The subject has been brought thoroughly up to date; and the form in which the work is presented (convenient size, leaded lines of clear large type, and arrestive paragraph headings), adopted at the outset by Pyle for the numbers of this system, adds to the ease with which one reads the book. An illustrated introductory chapter on ophthalmic anatomy, and more especially the anatomy of the nervous system connected with sight, is a commendable and helpful feature.

We have read this work of Knapp's with great interest and pleasure, and would cordially recommend it as worthy of careful perusal by specialist and by practitioner alike.

Canadian Literature

ORIGINAL CONTRIBUTIONS

The Public Health Journal, March, 1918:

The work of the psychiatric clinic of the Toronto General Hospital . . . C. K. Clarke.
The problem of the feeble-minded . . Marjorie Keys.
Mentally deficient children . . . C. M. Hincks.
Psychology and public health . . . W. G. Smith.
Mentally deficient recruits for Army service. Capt. O. C. J. Withrow.

Canadian Practitioner and Review, March, 1918:

Some clinical forms of infantile paralysis . F. T. Green.
The obstetric forceps versus drugs . . J. Hunter.

Canadian Practitioner and Review, April, 1918:

Vocational training . . . . . J. Roddick Byers.

The Canadian Journal of Medicine and Surgery, April, 1918:

Cancer of the large bowel . . . George E. Armstrong.

Medical Societies

No. 1 CANADIAN GENERAL HOSPITAL CLINICAL SOCIETY

Meeting December 6th, 1917

Lungs taken from Cases of Gas Poisoning. Demonstrated by Major Ower.

The general features were the intense œdema of the trachea and upper bronchi, with secondary broncho-pneumonia. One of these cases showed a false membrane of the larynx. Major Gwyn made some remarks on the treatment of the cases in the light of these specimens. The treatment by injection of calcium chloride,

Received for publication, April 8th, 1918.

which had been recommended when this case was first employed, had been clearly proved to be futile, if not dangerous, for in some cases local abscesses had been formed at the point of injection. Bleeding also he considered to be a useless measure. He concluded that the only measures which seemed to be of the slightest value were palliative. Warmth and soothing inhalations he had found very useful. He drew attention to the hopelessness of trying to reach the intensely engorged and inflamed mucous membranes of the throat by means of drugs. Captain Moffatt stated that he had found it of value to turn patients on their side now and then to allow for drainage of the mucus.

Case of Aortic Disease, probably of Syphilitic Origin. Demonstrated by Captain Logie.

In this case the *x*-ray showed enlargement of the heart to the right, and although no Wassermann was taken, he thought that it was almost certainly a specific case. The knee jerks were normal. Blood pressure was: systolic, 160; diastolic, 40. Major Gwyn remarked on the gradual recognition of the fact that a vast number of cases of aortic disease were of syphilitic origin.

Case in which the Heart had been markedly Irregular, with a Loud Murmur. Demonstrated by Captain Logie.

After a few days in the ward, heart had returned to normal with no treatment except rest. Major Gwyn commented on the number of cases we have had in our wards of men coming in with irregular hearts and murmurs of varying intensity, who, after a short rest, have had these signs entirely disappear, as in this case. The murmur was only heard while the man was on his feet. Captain Moffatt thought that it was probably of cardio-respiratory origin, as it was best heard in the third interspace and during respiration. He attributed it to the heart pressing on the lung.

Action of Atropine in a Case of Auricular Fibrillation. Demonstrated by Captain Moffat.

This case had been under digitalis treatment, and the heart rate had become markedly slowed, but the employment of atropine had produced a very definite quickening of the heart rate.

The meeting then adjourned.

The Canadian
Medical Association Journal

VOL. VIII. JULY, 1918 No. 7

ADDRESS IN MEDICINE ON THE SIGNIFICANCE OF "HEART MURMURS" THAT MAY BE FOUND ON EXAMINATION OF CANDIDATES FOR MILITARY SERVICE

BY LEWELLYS F. BARKER, M.D.

Medical Advisory Board No. 3, Selective Service Draft

Baltimore, Md.

THE mobilization of armies for the great war has led internists in all the countries involved to focus upon the heart of the recruit the many rays of new light that have originated in the more intensive studies of cardio-vascular conditions by the newer methods that have characterized the pathological angiology of our time. When I recall the views that were held by expert clinicians regarding the heart when I was an undergraduate medical student (1886–1890) and compare them with the opinions that prevail to-day, I am impressed with the vastness of the transformation that has taken place. In addition to the marked advance that has been made in methods of clinical examination of the heart and blood-vessels, there has been a profound change in our conceptions of the significance of signs and symptoms, a change that has resulted mainly from an increasing application of the findings of pathological angiophysiology and experimental angiopathology (in addition to those of pathological anatomy and histology that were formerly predominant in influence) to the problems of the clinic,

Delivered before the combined meeting of the Ontario Medical Association and the Canadian Medical Association at the Medical week in Hamilton, May 30th, 1918.

partly from a growth in knowledge and experience regarding the relations of pathological conditions outside the circulatory system to the genesis of disturbances of function (and sometimes of structure) within it. To illustrate how rapidly progress has been making in clinical angiology in the last thirty years, I need only remind you of (1) the transfer of emphasis (as far as the prognosis of the cardiopathies is concerned) from the consideration of the heart-valves to the consideration of the heart-muscle; (2) the insight into the nature and the significance of the cardiac arrhythmias that has followed upon studies of the initiation and conduction of impulses to cardiac contraction in man and in animals made possible by sphygmography and electrocardiography; (3) the greater precision in outlining the exact position, form and size of the several chambers of the heart and of the different portions of the aorta afforded by better methods of percussion and especially by orthodiagraphy and teleroentgenography; (4) the ease by which the blood-pressure, both systolic and diastolic, may now be clinically determined, and (5) the recognition of the fact that profound disturbances of circulatory function may have an extracardiac or an extravascular origin, resulting from influences arriving in the heart or the walls of the vessels from distant organs either by a neural pathway (vagal or sympathetic) or by a hæmal pathway (bacteria; toxines; hormones and other metabolic products). Surely, the examiner of the heart of the recruit to-day faces his problem with an attitude and a preparation that differ markedly from those of the examiner in previous wars! Moreover, the problem with which the examiner of candidates for military service is confronted is very different to-day from what it was formerly. The vast organization of war in our time involves not only a larger number of men but also a greater division of labour among the men within the army than was ever before necessary. Whereas, formerly none but men capable of undergoing the most severe bodily exertion dare be admitted to the army, to-day army organizations include an enormous number of positions that do not entail severe bodily exertion, and it is real economy to utilize for filling such positions men who have certain defects that would impaire their ability to undergo the extreme exertion of the front though they in no way limit their usefulness in the special services of the army not requiring great physical effort. Furthermore, as man power diminishes in a prolonged war, nations find it necessary to enrol, even for service at the front, men with physical defects that would bar them from such service at the beginning of a war when the supply of men is

abundant. The Central Powers in Europe are already sending men known to have valvular diseases of the heart to the front, men who earlier in the war had been rejected because of their physical unfitness. From the reports of how these men's hearts behave under strain and also from the reports upon observations in the allied armies of the Entente upon men returned from the front with old heart lesions that had escaped detection before they were sent, we are now rapidly acquiring information as to what diseased hearts will bear, information that will stand us in good stead should the war, unhappily, be prolonged to a period when our own man power shall have diminished to a degree necessitating action similar to that which has already been forced upon the Central Powers. Though it is possible that no such necessity will arise for the United States or for her allies in this war, our medical men feel that it is incumbent upon them to prepare for every contingency that may arise in a war in which the head of the nation has pledged every man and every dollar necessary to help to win. Plans should be made far ahead for all the situations in which we may find ourselves, however remote the possibility of some of them arising may now seem. All who are interested in the heart of the recruit and of the soldier, are in a better position to-day to judge wisely regarding the cardiovascular requirements in men entering the different branches of military service, than were the medical examiners in any earlier war; indeed, many matters that were in doubt in August, 1914, have been carefully investigated and in some instances of importance at least we have a clearer understanding than before. No one can look over the bibliography of the last four years bearing upon the heart of the recruit, and the heart of the soldier, without gratification. The intensive studies of British and French physicians, to which studies undertaken in America are now being added, have already solved a number of pressing problems, and as the war goes on, many of the questions that still perplex us will doubtless be satisfactorily answered.

The late Major Theodore Janeway, working in the office of the Surgeon-General of the United States army, during the last six months of his life prepared a circular in which the criteria for passing judgement upon cardiovascular conditions, were clearly set forth. This circular formed the basis for the regulations concerning the heart and blood vessels prescribed for medical examiners in the "Manual of Instructions for Medical Advisory Boards" issued in February, 1918. I desire to pay a tribute to the wisdom and judgement shown in the preparation of these regulations.

Even if certain of the rules will undergo modification as the result of further experience, the general principles laid down are undoubtedly valid, and if they are carefully applied in the examination of candidates for military service, very few mistakes will be made.

In my remarks to-day I shall make no attempt to deal with the whole question of cardiovascular conditions and the army, but shall confine myself to the narrower field of the significance of murmurs audible over the hearts of candidates for military service.

Classification of Heart Murmurs

Many of the classifications of heart murmurs, especially those given by writers on military subjects, seem to me unnecessarily elaborate and confusing. The simpler the classification, provided it is adequate, the better. The following simple classification would seem to be sufficient:

Heart Murmurs

1. *Intracardiac Murmurs.*
   - A. *Organic* (due to diseased heart valves).
   - B. *Inorganic* (not due to diseased heart valves).
     1. Murmurs due to relative insufficiency.
     2. Accidental murmurs due to (*a*) Abnormal composition of the blood; (*b*) Changes in velocity of flow; (*c*) Slight abnormalities of contraction due to nervous or other causes.

2. *Extracardiac Murmurs.*
   - A. Pericardial and pleuropericardial friction sounds.
   - B. Cardiorespiratory murmurs.
   - C. Precordial crackling of mediastinal emphysema.
   - D. Splashing and water-wheel sounds.

Even this simple list is formidable enough, but if the practitioner has been (1) trained in the analysis of the features presented by heart murmurs (time, topography, propagation, intensity, pitch, quality); (2) made familiar with the influence of respiratory movements, of change of posture, and of pressure of the stethoscope upon certain kinds of murmurs; and (3) become thoroughly acquainted with the other changes in the heart and circulation that follow upon organic disease of the heart valves and heart muscle, and with the physical methods of examination by which these can be demonstrated, he will rarely have difficulty in recognizing the

nature and significance of a murmur, so that he may place it in its proper class.

Recognition of Extracardiac Murmurs

A. and B. *Pericardial and Pleuropericardial Friction Sounds.* The friction rubs due to pericarditis, to and fro sounds, scratching in character, close to the ear, often divided into parts, often easily influenced by change in posture and by pressure of the stethoscope, are easy of recognition; so are the pulsatile friction sounds due to the rubbing of the outer surface of the pericardium against the pleura, some of the sounds being synchronous with the movements of the heart, others of them with the respiratory movements.

C. *Cardiorespiratory Murmurs.* These murmurs are not uncommon and by the inexperienced are often mistaken for intracardiac organic murmurs. They are most often systolic in time, though occasionally a diastolic cardiorespiratory murmur may be heard. These sounds arise in the lungs synchronous with the movements of the heart, hence the name "pulsatile pulmonary sounds" sometimes given to them. They are most often heard during inspiration, more rarely on expiration. They cease, or are much changed when the breath is held, and they are greatly influenced by changes in posture. They do not point to any disordered action of the heart and are entirely "innocent" sounds.

D. *Precordial Crackling.* In mediastinal emphysema, the air in the tissues may yield a crepitant sound, suggestive of pericardial friction, synchronous with the systole of the heart. The condition is so rare as to be practically negligible in the examination of recruits.

E. *Splashing and Water-wheel Sounds.* These will be rarely met with in military work. They depend upon the occurrence together of air and fluid near the heart (hydropneumopericardium; hydropneumothorax; cavity in lung; distended stomach).

Recognition and Interpretation of Intracardiac Murmurs

A. *Organic Murmurs Due to Diseased Heart Valves.* Here we have to deal with the murmurs that occur in stenosis and insufficiency of the aortic, mitral, pulmonary and tricuspid valves. In the examination of recruits, aortic and mitral disease will frequently be encountered, while disease of the pulmonary and of the tricuspid valves will only very rarely be met with.

The systolic murmur of aortic stenosis is usually a loud, rough murmur audible in the second right intercostal space close to the sternum. It is propagated toward the carotids in the neck. On palpitation over the aortic area a systolic thrill can be felt. The aortic second sound is feeble or absent. The pulse is small and anacrotic. The pulse rate is often slow. The heart's apex is displaced somewhat downward and to the left. Sometimes a systolic murmur in the second right intercostal space is due to dilatation of the aorta (lues; arteriosclerosis). If suspected, the proof of such dilatation can be brought by percussion, and especially by roentgenoscopy; and to determine ætiology, the Wassermann test may have to be applied. Definite aortic stenosis is cause for unconditional rejection. Luetic aortitis disqualifies for full military service, but if without symptoms does not disqualify for special service.

The diastolic murmur of aortic insufficiency is usually a soft aspirative murmur replacing the second sound or following it in the second right intercostal space. It may be short, but is oftener long and decrescendo in character, occupying a large part of the long pause. It is often propagated along the left margin of the sternum and may often be best heard in the third and fourth intercostal spaces on the left side. It is surprising how often such a murmur is entirely overlooked, or mistaken for a systolic murmur, even by medical men supposedly well-trained. The murmur can often be better heard with the naked ear or the monaural stethoscope than with a binaural instrument. Aortic insufficiency is associated with a strong, circumscribed dome-like apex impulse (*choc en dome*), a collapsing pulse at the wrist, visibly pulsating carotids, pistol-shot sounds in the peripheral arteries and enlargement of the left ventricle. In the young recruit, aortic insufficiency when associated with mitral disease is most often a result of rheumatic endocarditis; when not associated with mitral disease, it is most often due to luetic aortitis. In older men, aortic insufficiency is often due to atherosclerotic changes in the aortic valves.

The diastolic murmur of mitral stenosis, often rumbling in character and associated with a palpable thrill, is usually audible only in a circumscribed area near the apex of the heart. Sometimes the murmur is audible only at the very end of diastole (presystolic), terminating in an abrupt snapping first sound. In many cases of slight mitral stenosis, no murmur can be heard, the diagnosis depending then upon the existence of a snapping first sound associated with a strongly accentuated (and often duplicated) pulmonary

second sound. Mitral stenosis is always due to a preceding endocarditis. It is in my experience one of the conditions most often overlooked by examiners of recruits.

The systolic murmur of mitral insufficiency is a blowing murmur, usually maximal at the apex where it replaces the first sound, propagated toward the axilla, and sometimes to the angle of the left scapula and often audible also in the second left intercostal space. When due to organic disease of the mitral valve (valvulitis) it is accompanied by accentuation of the pulmonic second sound, by some enlargement of the left ventricle and of the left atrium, and often by signs of mitral stenosis. When not accompanied by signs of mitral stenosis the systolic murmur due to valvulitis may be indistinguishable from the systolic murmur due to relative insufficiency of the mitral orifice from muscular relaxation. In older persons the majority of mitral systolic murmurs are due to relative insufficiency; in younger persons mitral systolic murmurs due to valvulitis are very common. Accidental murmurs are often mistaken for the murmur of mitral insufficiency (*vide infra*).

The systolic murmur of stenosis of the pulmonary valve maximal in the second left intercostal space, propagated towards the left clavicle and accompanied by a palpable thrill, is a rare finding. When present, it is usually due to a congenital heart lesion, and but few live to the age of the recruit. A loud harsh systolic murmur in the third left space (Roger's murmur), propagated transversely, but not towards the left clavicle, is heard in congenital defect of the interventricular septum. This condition is so rare as to be of but little interest for military medicine.

The diastolic murmur of insufficiency of the pulmonary valve is also an exceedingly rare finding and need not be discussed.

The diastolic murmur of tricuspid stenosis is also extremely rare.

The systolic murmur of tricuspid insufficiency is usually due to a relative insufficiency depending on muscular relaxation. It is audible in the tricuspid area and is not transmitted to the left of the apex. Other marked signs of circulatory insufficiency are present and the heart is enlarged to the right. Persons presenting this murmur are usually so obviously ill that they are never seriously considered for military service.

B. *Inorganic murmurs* (*not due to diseased heart valves*).

Of the *inorganic murmurs due to relative insufficiency of valvular closure* (from muscular relaxation), those audible at the mitral and tricuspid orifices are the most common. They have been referred to above in connexion with the systolic murmurs due to organic

changes in the valves. Occasionally diastolic murmurs due to relative insufficiency of the aortic and pulmonary valves are heard, but they are rare. Though these murmurs of relative insufficiency are spoken of as functional murmurs, they are in my opinion often of graver significance than are some murmurs due to organic valve disease, for they always point to enfeeblement of the myocardium.

Of the *inorganic murmurs known as accidental murmurs*, a large number may be met with on examining the hearts of recruits. Some of them are due to *anæmia*, though most of them depend upon changes in the *velocity of flow* or upon *slight abnormalities in the contraction* of the heart muscle due to nervous or toxic influences. They are very common when the heart is excited (neurasthenia; hyperthyroidism). Many of the men who present them and who are admitted to the army will doubtless later on exhibit the "irritable heart of the soldier", the "effort syndrome", or "neurocirculatory asthenia." They are common in men with long narrow chests, with low diaphragm, and with cor pendulum (drop heart). These accidental murmurs may occur at sites in which organic murmurs are often audible (at the apex and in the second left space), but they are often audible over regions in which organic murmurs are seldom heard, as in the preventricular region. Such accidental murmurs are nearly always systolic in time, but they usually occupy only a part rather than the whole of the systole; in other words they are merosystolic rather than holosystolic murmurs, whereas organic murmurs, and murmurs of relative insufficiency tend to be holosystolic rather than merosystolic. Furthermore, accidental murmurs are usually (though not always) soft, aspirative, superficial murmurs. They are prone to marked variation in intensity, being much changed often by change in posture and by the respiratory movements. Above all they are not associated with enlargement of the chambers of the heart, nor with accentuation of the pulmonic second sound.

The Relation of Murmurs to Acceptance and Rejection of Candidates for Military Service

A careful study of the Selective Service Regulations (U.S.A.) as they now stand will make it clear that:

1. The presence of an organic murmur is cause for unconditional rejection.

2. The presence of an inorganic murmur due to relative insufficiency of a valve, if associated with any enlargement of the heart, or with accentuation of the pulmonic second sound, is cause

for rejection; if unassociated with these signs and the response to exercise is normal, the recruit may be accepted for special service.

3. The presence of an accidental murmur due to anæmia, to neural or toxic influences, or to velocity of flow, is not in itself cause for rejection.

4. The presence of a cardiorespiratory murmur is of no pathological significance, and, of course, does not reject.

Comments

Experience at a Medical Advisory Board during the past three months, where with Drs. Sprunt, Miller, and Carter, we have examined the hearts of twenty-five hundred drafted men between the ages of twenty-one and thirty-one, indicates:

1. That many organic murmurs (diastolic murmur of aortic insufficiency, presystolic murmur and snapping first sound of mitral stenosis) are often entirely overlooked by examiners in Local Boards, for they are not infrequently detected in men referred to the Advisory Board for defects other than those of the cardiovascular system.

2. That many extracardiac (cardio respiratory) murmurs, and accidental intracardiac murmurs, are suspected by medical examiners to be murmurs of serious import.

3. That the hearts of some of the men presenting organic murmurs are better prepared to stand exertion than are the hearts of some men presenting no murmurs.

4. That good response to the exercise test by no means rules out the existence of organic disease of the valves of the heart.

5. That many men with organic disease of the valves of the heart need not be unconditionally rejected, though according to present regulations they must be, for many of them are entirely capable of undertaking special service not involving severe exertion, and some of them could, without harm, even be given duties requiring considerable bodily exertion. Experience in the armies in Europe would indicate that mild stenotic lesions stand strain better than lesions causing valvular insufficiency. The lesions of "barrage" are less serious than the lesions of "fuite".

6. That, on the whole, while the study of cardiac murmurs is of great importance in estimating the fitness of a candidate for military service, still greater importance attaches to the study of the condition of the cardiac muscle and to the estimation of its ability to bear strain.

DUODENO-JEJUNOSTOMY, ITS INDICATIONS AND TECHNIQUE

By James McKenty, M.D., F.A.C.S.

Winnipeg

THREE instances are reported in the literature of surgery in which duodeno-jejunostomy, an anastomosis between duodenum and jejunum, was performed. The first was by Albert W. Stavely[1] on December 16th, 1907, for chronic gastro-mesenteric ileus; the second by Edwin Beer[2] on September 23rd, 1914, for the relief of hæmorrhage from an angioma involving the duodeno-jejunal junction, and the third instance was by N. P. Ernst[10] in November, 1914, for congenital atresia of the duodenum in an infant. In the last case the jejunum was brought across in front of the transverse colon and anastomosed to the duodenum about the junction of its first and descending portions. In the two first cases the anastomosis was made to the transverse portion of the duodenum below the transverse colon.

I wish to report two additional cases:

Case 1. Female, aged thirty-seven, was referred to me by Dr. J. P. Howden for operation with a diagnosis of chronic duodenal ulcer. On January 28th, 1914, the abdomen was opened, no ulcer was found, the gall bladder was normal, the appendix was atrophic and free from adhesions; it was not removed. Both the stomach and duodenum were dilated and the pyloric ring was quite patulous. The duodenum was approximately the size of the transverse colon, a diameter of between two and a half to three inches. On raising up the transverse colon, the transverse portion of the duodenum could be seen bulging through the meso-colon. The distension of the gut was present up to the point where it is crossed by the superior mesenteric vessels. On the left of these vessels the bowel was empty and flaccid. On introducing a finger underneath the artery and elevating it, gas passed from the duodenum into the jejunum and the distension

*Read at the forty-eighth annual meeting of the Canadian Medical Association, Montreal, June 15th, 1917.

of the duodenum subsided. This was observed by Dr. Howden and myself, and was regarded as proof of the presence of obstruction by the mesenteric vessels. Without knowing of Stavely's previous operation, I decided to anastomose the jejunum to the transverse portion of the duodenum in front of the mesenteric vessels. This was done in the manner to be presently described.

Case 2. Female, aged twenty-three. The preöperative diagnosis was chronic appendicitis with secondary disturbance of the gastric functions. On November 26th, 1914, the abdomen was opened through a right rectus incision. A retrocolic chronically inflamed appendix was removed. The colon, gall bladder, stomach and pancreas were found normal. The duodenum was dilated, as in the first case, but to a less degree. On elevating the root of the mesentery gas passed from the distended duodenum into the empty jejunum. Some degree of obstruction was undoubtedly present, so a duodeno-jejunostomy was decided upon and performed, as in the first case.

Results. There was no mortality from the operation in these five cases. Beer's patient died on the seventeenth day from a recurrence of the hæmorrhage from the tumour after having been out of bed for several days and convalescing normally. In all of them the post-operative vomiting was unusually prolonged and distressing. In my two cases the stomach tube had to be used several times during the first two days to prevent threatening acute dilation of the stomach. After the second day convalescence became normal.

End Results. Stavely[3] reported his case cured September, 1910, three years after operation. My first case was promptly relieved of her symptoms and has remained well up to the present, now three and a half years after operation.

My second case was also promptly relieved, and continued well for a year after operation. At the time of operation her weight was one hundred and twelve pounds, a year later it was one hundred and forty pounds then she began to lose in weight and to suffer from constipation. She now weighs one hundred and twenty-eight pounds, and is in fair health excepting for obstinate constipation. This patient has the enteroptotic figure, a prolapsed right kidney, an unstable nervous system and inherits a predisposition to tuberculosis. To these and to the stasis in the cæcum and ascending colon, rather than to a recurrence of duodenal stasis, I belive her present complaints are attributable. The chief symptom of chronic gastro-mesenteric ileus (the vomiting of bilious material) has not recurred.

Indications. This operation should be considered as one of the means of relief—perhaps the most effective—in all cases in which there is obstruction at the lower end of the duodenum or the upper end of the jejunum. The conditions which may give rise to obstruction here are:

1. Clamping of the bowel between the superior mesenteric artery and the aorta;
2. Kinking at the duodeno-jejunal flexure;
3. Obstruction at the site of anastomosis after posterior gastro-enterostomy;
4. Tumours, either outside of or within the bowel.
5. Congenital atresia.

Of these, the first, that is, clamping between the blood vessels, is undoubtedly the most common. It has long been recognized as a factor in the causation of acute dilation of the stomach and duodenum. Some writers (Connor,[4] Laffer[5], Moore[6]) regard it the most important factor. Acute gastro-mesenteric ileus is well known to the profession and especially to surgeons as one of the complications liable to occur after operations. Chronic gastro-mesenteric ileus on the other hand, if one may judge from the paucity of the literature on the subject, is not well known and has received little attention. That it does occur, however, has been amply established chiefly by the papers of Bloodgood[7], Stavely[3] and Moore[6], in which may be found reports of seventeen cases in which the diagnosis was verified either by operation or autopsy. It is reasonable to expect, also, that gastro-mesenteric ileus may, like most diseases, assume either an acute or chronic form. Indeed, it is likely that the chronic form is more common than the acute, and, that the acute is often engrafted upon a previously existing chronic partial obstruction. Bloodgood[8] writing on this subject says: "Since January, 1911, in an experience with twenty cases of resection, I have observed in five instances that the constriction at the root of the mesentery is due to a pull on the root of the mesentery by the dilated cæcum displaced into the pelvis." . . . "The duodenal dilatation and its cause were demonstrated without question. These patients have been relieved after the resection of the right half of the colon. Up to this time, I was unfamiliar with this possible explanation of the cause of chronic dilatation of the duodenum and have not found it mentioned in the literature. . . . As these patients also suffer from constipation, it is my opinion that resection of the colon will relieve their symptoms better than

FIG. II.—Showing incision in meso-colon, and relation of the blood vessels to duodenum. The incision in duodenum is shown too close to pancreas.

anastomosis between duodenum and jejunum." Since my interest in this subject was aroused, January, 1914, I have during laparotomy frequently examined the state of the duodenum and root of the mesentery, and, I am satisfied that slight degrees of obstruction at this point are common, especially in individuals subject to visceral ptosis. Bloodgood[8] has pointed out that the loaded prolapsed cæcum exerts a pull upon the root of the mesentery "when the last portion of the ileum has an unusually short mesentery". Observations made by me during operation and upon fresh cadavers confirm Bloodgood's statement. This pull narrows the angle between the mesenteric artery and aorta and consequently compresses the bowel. Herein may lie, in part, the explanation of the relief afforded by abdominal supporters to the gastric symptoms of visceral ptosis.

The diagnosis of chronic gastro-mesenteric ileus is made with certainty only after the abdomen is opened. At least no case has been reported in which the diagnosis was made previous to opening the abdomen.

Including my two, there are, in all, nineteen cases on which the diagnosis has been verified by operation or autopsy. In ten of these, some kind of operation intended to relieve the condition was done. Gastro-enterostomy was performed in two, followed by one death, and a cure in one case.

Duodeno-jejunostomy was done in three cases with good results in all. In five cases, Bloodgood did a resection of the right half of the colon with good results in four. It is not clear from the report whether there were other reasons for the resection besides the mesenteric obstruction. The association of ptosis of the cæcum with chronic obstruction by the root of the mesentery cannot be considered a sufficient reason for removing an otherwise healthy cæcum and colon. A less mutilating operation, duodeno-jejunostomy will more effectively overcome the obstruction and, if combined with colopexy, will also relieve the pull upon the root of the mesentery. In eleven instances, in which a minor degree of chronic gastro-mesenteric ileus was discovered during abdominal section, I have performed cæco-colopexy for this purpose. Only four of these patients have been traced. In these four, the results support the view that the fixation operation had a share in the beneficial effect, but, as in all of these patients, other operations were done at the same time, no positive conclusions can be drawn.

Duodeno-jejunostomy may, also, prove the easiest method

of relief in those cases of vicious circle after the so-called no-loop posterior gastro-enterostomy in which it may be impossible to make an anastomosis between the limbs of the jejunal loop.

Beer's case is an example of its application for the relief of obstruction due to tumours. In this case Beer ligatured the bowel between the site of the anastomosis and the tumour.

Obstruction due to adhesions or kinking at the duodeno-jejunal flexure has been treated by separation of the adhesions, and by cutting the thickened meso-colic fold and ligament of Treitz. Lockwood[9] described this latter stricture as a band of considerable strength attached above to the left crust of the diaphragm, and below to the vertical part of the duodenum, from which it is continued on between the layers of the mesentery, and he suggests the name, "Suspensory Muscle of Duodenum and Mesentery." If this view of its function be correct, unhappy results may follow its severance. The short-circuiting is devoid of these serious possibilities and will meet the requirements more effectively.

Technique. When dilatation and distension of the duodenum are present its transverse portion, on raising up the transverse colon, can be seen to bulge through the mesocolon between the right colic and ileocolic branches of the superior mesenteric artery. The normal duodenum, except in very thin individuals, is not visible in this region. My first patient was moderately fat, yet the bulging was quite evident. The posterior parietal peritoneum is opened between the right colic and ileo-colic arteries and the duodenum thereby exposed. This portion of the bowel is attached below to the root of the mesentery, and posteriorly to the vena cava by loose areolar tissue, strengthened here and there by fibrous bands. Above, it is intimately connected to the head of the pancreas and receives several branches from the inferior pancreatico-duodenal artery, which lies between it and the pancreas. Since my first operation I have examined the anatomy of this region carefully in five fresh adult bodies on which autopsies were being performed, and in two infant bodies, and I feel satisfied of the correctness of these statements.

The mobilization of the duodenum necessary for the application of a clamp can therefore be effected most readily by separating the bowel from its inferior and posterior connections. This is done by blunt dissection, aided occasionally by the use of a sharp instrument to severe the fibrous bands. In this stage of the operation bleeding points requiring ligature were not met

with in my two cases. After mobilizing the duodenum the intestines are clamped and brought together in the isoperistaltic position and the anastomosis made by suture in the usual manner. Stavely used a Murphy button. The opening in the posterior parietal peritoneum is closed by interrrupted sutures in such a manner as to hold the jejunum in position. In my cases the union was made at a point about six inches from the upper end of the jejunum. Stavely and Beer chose a point about a foot from its upper end.

Conclusion

1. Duodeno-jejunostomy is not more difficult to perform than posterior gastro-enterostomy and its mortality should not be greater. In chronic gasto-mesenteric ileus it is the operation of choice, and in the acute form, if any operation be advisable, it should be given a trial. Gastro-enterostomy has no place in the treatment of this condition.

2. Cases of slight dilatation of the duodenum due to partial obstruction by the root of the mesentery, in which the pull of the prolapsed cæcum can be demonstrated, should have the cæcum and colon suspended, as there is ground for expecting that a fair proportion of them will thereby be permanently relieved and avoid the necessity of either a short-circuiting operation or a resection of the colon.

3. In the absence of pathological changes in the cæcum and colon demanding their removal, their resection for the relief of chronic gastro-mesenteric ileus is not necessary nor advisable, as the same effect can be attained by less dangerous means.

4. Chronic gastro-mesenteric ileus is probably a more common condition than has been suspected. Stavely says, "a fair proportion of cases now classed gastro-neuroses" is due to "incomplete obstruction by the root of the mesentery." In every case of "chronic dyspepsia" it should be kept in mind as a possible cause, and in every exploration of the upper abdomen the condition of the duodenum and root of the mesentery should be examined. Inasmuch as the presence of partial obstruction here predisposes to post-operative, acute dilatation of the stomach, the knowledge gained will be valuable even if no operation for the relief of the obstruction is undertaken. By this means also, a question regarding, which there exists much difference of opinion, may by the records of a large number of observers, be finally settled.

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THE DIAGNOSIS OF INFLAMMATIONS OF THE UVEAL TRACT OF SYSTEMIC ORIGIN

By W. Gordon M. Byers, M.D.

Montreal

LET me define the scope of my paper by saying in the first instance that I do not intend to speak, of course, in a company of fellow oculists of those ordinary signs upon which the diagnosis of inflammations of the uveal tract are made *per se;* nor of changes which are supposed to be characteristic of special infections, believing that these are too infrequent and too uncertain to be relied upon as trustworthy to any appreciable degree. I shall confine myself to that aspect of diagnosis which has to do with the determination of the cause or causes underlying uveal inflammations of systemic origin, it being understood that the term "uveal" covers any one or all of the divisions of the vascular coat, namely, iris, ciliary body, and choroid.

Theoretically and ideally this subject belongs to the specialist in internal medicine; but as a matter of fact the control of the field generally remains in whole or in part in the hands of the oculist, for the reason that the investigations to be undertaken have to do with the solution of a problem in his field, because he forms the most convenient clearing house for the reports of the various consultants, and because his advice is essential in any case in the reaching of final conclusions. I freely admit that this topic could be more thoroughly and ably presented by an internist; but my paper embodies my efforts to understand the subject from the standpoint of the ophthalmologist, and I look to you for a full cargo of experiences and constructive criticisms in exchange for my presentation.

It is really needless in the case of those present to point out the importance of this matter. Uveal inflammations are of comparatively frequent occurrence; they entail, at best, suffering and a loss of time that often occasions hardship, especially among the poorer classes; and at their worst they lead to irremediable destruction of

A paper read by invitation at the closing meeting of the section of Ophthalmology and Oto-Laryngology of the Academy of Medicine, Toronto, April 8th, 1918.

vision or even blindness. It is essential to determine the cause, not alone to heal the primary disturbance, but because, left to smoulder, the underlying diseases may ultimately produce ocular recurrences, grave disturbances in other systems of the body, or even death by attacking vital centres. It would seem in many instances almost providential that mild uveal inflammations occur to warn the patient of grave systemic disease.

Grounded in the pioneer work of Pasteur and its brilliant interpretation by Lister, and advanced more perhaps by the appreciation of the systemic manifestations of gonorrhœal urethritis than any other influence, the investigations of several generations of workers have in recent years thrown a flood of light upon the active part played by focal infections in the production of ocular metastases and of metastases in other parts of the body. This discovery has, in fact, in conjunction with data yielded by more refined clinical methods of investigation and specific laboratory tests, revolutionized our ideas regarding the ætiology of uveal inflammations. Our shattered conceptions are still in process of reconstruction; but one now clearly sees in outline the subject as it ultimately must be presented.

Certain of the etiological factors of the older writers—notably syphilis and tuberculosis—still stand, but with their relative importance more clearly defined; while numerous others, with a connexion still existing, have their relationship to the ocular disturbances explained in quite a different way. Thus, for instance, but a short time ago chronic rheumatism was regarded as one of the well-known causes of uveitis; to-day chronic rheumatism in its protean dress is looked upon as largely, if not entirely, symptomatic of those focal infections that are also the cause of the ocular disturbances. Affections of the respiratory tract, the ætiological importance of which was so strongly emphasized by Haas[1] and by von Michel[2] are now seen to play their part by favoring the development of organisms in cases of bronchitis, bronchiectasis, and allied conditions. Anæmia can not longer be regarded as a causative factor, but merely as a predisposing influence, in many cases probably occasioned by, and itself expressive of, the destructive action of the systemic infections upon the blood. The direct part played by diabetes and by gout has also been brought into question since pathologists have refused to accept a non-bacterial origin for inflammation; and so on with other items. The outstanding fact as regards ætiology is, however, the important rôle played by focal infections; not only on account of the clarification which it has

brought to this subject, but because of the therapeutic possibilities the discovery has opened up.

These points are well illustrated by the valuable findings of Irons and Brown[3], based upon a study of one hundred cases of iritis, in which every modern method of research was brought to bear upon the elucidation of the ætiology.

THE CAUSES OF IRITIS IN ONE HUNDRED CASES

Infections	Alone	With other infections	Total	Coincident Infections						
				Syphilis	Gonorrhœa	Tuberculosis	Dental	Tonsil	Sinus	Genito-Urinary
Syphilis	10	13	23	..	8	5	5	1	1	..
Tuberculosis	8	..	8	..	..	..	..	..	..	..
Gonococcal infection	7	2	9	..	..	..	1	1	..	..
Dental infection	7	11	18	2	2	2	..	7	1	..
Tonsillar infection	7	9	16	1	3	2	7	..	..	..
Sinus infection	1	2	3	..	..	..	1	1	..	..
Genito-urinary (non-venereal)	3	..	3	..	..	..	..	..	..	..
Other infections	2	..	2	..	..	..	1	..	..	..
No cause found	1	..	1	..	..	..	..	..	..	..
Combined infections	..	..	17	8	9	7	8	13	5	1
			100							

Studying the accompanying table, one sees that the cases can be divided into four classes, namely:

Class 1. (Forty-five cases): In which a single factor was isolated as the sole cause of the uveitis.

Class 2. (Thirty-seven cases): In which, though several possible ætiological factors were determined, the investigators were able to say after a careful weighing of all the evidence that one only was responsible for the uveitis.

Class 3. (Seventeen cases): In which several possible ætiological factors were demonstrated, but they were unable to throw the onus upon any single one (combined infections).

Class 4. (One case): In which it was not possible to ascertain the cause.

If we add the figures of Class 1 and Class 2 together, we obtain percentage data regarding the ætiology of uveitis that are striking in comparison with those still found in current works on ophthal-

mology, though the work of Brown and Irons was not intended primarily to bring out these points. Thus, for instance, syphilis, always heretofore accorded the first place among the causes underlying uveitis (stated by some authorities to be as high as 90 per cent.), is held responsible for only 23 per cent. in this series; while focal infections, if taken to include systemic gonorrhœa, as I think they should, originated the disorder in 51 per cent. of the cases. Here, indeed, is something in the way of an upheaval. A further arrestive fact is, that, of the fifty-one cases of focal infection, the teeth, tonsils, and sinuses alone were responsible for thirty-seven. Tuberculosis, with eight cases to its credit, strengthens the growing conviction of thoughtful clinicians regarding its ætiological importance. It is worthy of note from the substance of the paper that, while several of the patients were referred to the authors with a provisional diagnosis of "iritis from auto-intoxication", and diabetes was present in three more instances, in none of these six cases did Irons and Brown fail to find active infectious processes.

From the point of view of topographical interest (for it has long been conceded that ætiological factors vary with locality), and for purposes of comparison, I have analyzed the findings in the last twenty-five cases from my private practice in which I have been able to have a satisfying systemic examination carried out. The figures are as follows:

THE CAUSES OF UVEITIS IN TWENTY-FIVE CASES

Syphilis	3 cases = 12 per cent.
Tuberculosis	4 cases = 16 per cent.
Gonorrhœa	0 cases = 0 per cent.
Sinuses	2 cases = 8 per cent.
Teeth	5 cases = 20 per cent.
Tonsils	1 case = 4 per cent.
Gall bladder	1 case = 4 per cent.
Genito-urinary (nonvenereal)	1 case = 4 per cent.
Combined infections	4 cases = 16 per cent.
No cause found	4 cases = 16 per cent.

The most striking feature in the way of percentages is, that focal infections play practically the same part in this series (40 per cent.) as in that of Irons and Brown. The tally must be more than a coincidence, and is in keeping with incoming statistics generally. In my series, syphilis is responsible for only 12 per cent., while tuberculosis stands at 16 per cent., due probably to

the respective facts that my patients were drawn with few exceptions from the better class (the patients of Irons and Brown were 47 per cent. private, and 53 per cent. public or venereal), and that two of my patients were tubercular, residing in mountainous resorts from which I draw an appreciable percentage of my clientele. The combined infections were: Chronic bronchitis, pyorrhœa and alveolar abscesses, and diabetes, one case; sphenoiditis and gastro-intestinal stasis, one case; syphilis and teeth conditions, one case; tuberculosis and tonsilar infection, one case. It should be noted that in both series the percentage of cases of focal infection would be heightened by adding those included under the combined infections. I feel, on looking back, that the number of undetermined cases in my group might have been reduced by closer attention to the history, and by the inclusion of exploratory examinations in fields which were left untouched.

But while these figures are interesting and important as illustrating the points I have mentioned, it is felt they are inadequate for final conclusions. I have quoted them particularly to show that an investigation into the causes underlying inflammations of the uveal tract resolves itself into a search for: (*a*) Some systemic disorder of which the ocular disturbance is an expression (more especially syphilis and tuberculosis); or (*b*) Some focus or foci of infection originating the uveitis by way of metastasis.

In regard to the carrying out of the routine systemic examinations of these cases, some interesting questions arise. There is no doubt that the work is ideally done in the wards of a well-equipped modern hospital by a specialist in internal medicine, and where the patient, either well-to-do or poor, has the time and the inclination, the problem is easy of solution. Greater difficulties are presented when the patient is in modest circumstances, and can ill afford the time and the money for hospital fees and special tests; but, if one has a free hand, one can get satisfying results by referring the case to a well-trained general practitioner, who has access to, or is in touch with, a modern laboratory. Some of the cleverest diagnoses I have known have been obtained in this way; but the matter is well nigh hopeless when a practitioner, necessarily associated with you, jealously maintains control and presents you with preconceived ideas rather than carefully established facts.

There is undoubtedly a tendency in the profession to evade the issue arising from these examinations: there is a fear that the findings may not be sufficiently tangible to justify the often considerable expenditure of money on the part of the patient. This

point of view is, I feel, entirely wrong. One might as well desist from an intubation in an apparently hopeless case of diphtheria, or from an appendectomy in the presence of a grave peritonitis; for the dangers in focal infections are often equally menacing. Nor does it suffice to rest satisfied with the verification of leads from the history, in view of the large and now well-established groups in which there are associated and combined infections. The whole system must be cleared of every source of danger. As a matter of fact, I have never experienced difficulty in securing the coöperation of patients, or encountered dissatisfaction, once the matter had been clearly explained; and my experience now with these cases has been a very large one. The fact that Brown and Irons failed in only 1 per cent. of their cases shows what can be done in the matter, and surely offers the patient a good run for his money.

I should like to invite a general expression of opinion in regard to the extent, sequence, and standardization in these examinations. As a starting point for discussion, then, it seems to me that, in the order mentioned, the following should be the minimum required:

1. A thorough general examination of the body by the internist or practitioner, which shall include an inspection of the fæces, a complete urinalysis, and a blood examination. In this examination great emphasis should be laid on the history, in view of the importance of establishing a past relationship between the ocular disease and some one of the known ætiological possibilities.

Under this heading it is taken for granted also that bacteriological examinations of the secretions from suspected foci, and of the aquæous humor, will be carried out as indicated; not alone for diagnostic purposes, but keeping in mind the possibility of securing valuable autogenous vaccines.

2. A Wassermann test. Because of the important rôle played by syphilis in diseases of the uveal tract, I have almost uniformly since its introduction made the Wassermann test a part of the routine examination; and my experience has only strengthened this resolution. I do feel strongly that no reliance should be placed on the history alone in these cases. During the past year a Wassermann test has yielded a strongly positive reaction in five women who are, I am certain, entirely above reproach, and whose history gave no clue whatever to the infection.

I must relate the story of one of these cases to illustrate a mental attitude occasionally seen, but difficult to understand. The patient was a gentlewoman who came to me with a double-sided iritis. Her physician refused absolutely to have a Wassermann

test carried out, and told a friend of the woman, who knew of the relation between syphilis and eye troubles, to "mind her own business" when she suggested a possible connexion in this instance. At the end of two years, when I saw the case, dense iritic adhesions were present on both sides, and vision was reduced to one half the normal.

On the other hand, during the past winter, in two instances (one of scleritis, and the other a marked uveitis with deep scleral involvement) a negative Wassermann was contradicted by a striking improvement under anti-syphilitic remedies.

Recent researches regarding the nature of the Wassermann test help to explain these discrepancies. The subject has been lately presented in a very lucid manner by my colleague, Dr. Oertel[4], whose paper, appearing in this month's number of our JOURNAL OF THE CANADIAN MEDICAL ASSOCIATION, will be well worth a careful perusal. I will, however, read at this time a few extracts from the article as bearing on the point in hand: "There are," he says, "several points which were plain from the start in relation to this and similar reactions. First, that it is strictly quantitative, so that all reagents employed, antigen, amboceptor, and complement must be quantitatively titrated in order to determine their strength, before they can be employed for a reaction. Secondly, that certain technical precautions must be taken in order to obtain reliable readings. This applies particularly to the interpretation of what constitutes a positive reaction, for there are many cases in which the hæmolysis is only partial or incomplete and in which it is doubtful whether this is produced by unfixed complement or, possibly, by a certain hæmolytic property possessed by the human serum to be tested. Only the straight cut, complete occurrence or absence of hæmolysis are decisive negative or positive reactions, partial reactions, *i.e.*, partial hæmolysis (often indicated by one plus or two plus by laboratory investigations) are not to be regarded as positive Wassermann reactions. In order to avoid these errors and to simplify the procedure, various modifications of the reaction have been introduced. It follows that the physician or surgeon should have some intelligent acquaintance with the technique and manner of interpretation of the laboratory worker to understand and apply results properly. . . . Taking all these facts into consideration it is clear that the Wassermann reaction is a colloidal absorption phenomenon and no chemical reaction; it depends for its occurrence upon the presence of lipoidal proteid complexes in the serum of syphilitics which, when put in contact

with other lipoida extracted from any lipoid-rich organs, possess the ability to absorb complement. What determines the specific absorption and fixation of these substances to each other is at present impossible to say. . . . These considerations are not only of theoretical, but of great practical importance, for the specificity of the Wassermann reaction has thereby been much limited. We are enabled to understand now better the gradually increasing number of instances in which the Wassermann reaction is positive in non-syphilitics and the lack of the reaction at time in syphilitics. As a result of long continued observations, carefully carried on by Dr. Bruère in these laboratories and by other observers, it may be laid down as a general proposition that any agent which either increases or diminishes the lipoid protein contents of the blood interferes with the reaction so that the results are unreliable as a test for syphilis. Under such conditions positive or negative reactions may occur. Thus, during digestion (particularly after fatty meals), acidosis, lipæmia, and after chloroform or ether narcosis, the blood may give a strong Wassermann reaction in non-syphilitics, that is, lipoids are dissolved and then thrown into the blood. On the other hand it appears that the reaction after long chloroform or ether anæsthesia may become negative in syphilitics, possibly because much lipoid has been dissolved out of the blood. Thus, the blood may also be negative and the cerebrospinal fluid positive. The same applies to infectious diseases, especially where, as in pneumonia, rapid resorption of large amounts of inflammatory exudate occurs or in ulcerating tumors. Here also the blood becomes rich in euglobulin which is one of the components of the amboceptor in syphilitic blood.

This very practical lesson must, therefore, be drawn, that, in order to obtain a reliable test for syphilis with the Wassermann reaction, it is necessary to use the following precautions: First: blood must be taken directly from vessels, avoiding the skin (subcutaneous fat), and not by blister or cupping. Second: blood should never be taken (*a*) after a meal (but while fasting); (*b*) during fever; (*c*) during any acute infectious disease; (*d*) during suppurations or resorptions of large inflammatory exudates (pneumonia, empyema, etc.), or even in ulcerating or necrosing tumours; (*e*) after narcosis. As a second proposition, it may be put down that a negative Wassermann does not necessarily exclude syphilis."

3. Examinations of the nose and accessory sinuses, the throat, and the teeth by specialists to supplement those of the general practitioner.

It is a matter for wonderment, looking back, that we did not sooner appreciate the possibilities of infection from these fields, in view of the opportunities for bacterial development in the crypts of tonsils and adenoids, in the crevices and pockets about decaying teeth, and in the cavities adjacent to the nose, often so imperfectly drained and prone to closure; and considering also the intimate connections of these parts with the blood vessels, and especially the lymph vessels, of the head and chest. Our knowledge, too, of the richness and virulency of the bacterial flora of these parts is now of some considerable duration.

Of the three fields under discussion, that of the nose and accessory sinuses is undoubtedly the most difficult. An *x*-ray plate of the upper part of the face, taken from the front, has seemed to me sufficiently often of value to justify its inclusion in the routine examination. In a recent case of mine (one of very severe uveitis with heavy clouds of vitreous opacities greatly reducing the vision in the only serviceable eye), who did not complain in any way of nasal disturbance, an *x*-ray plate, made for the sake of completeness, revealed marked disease of the antrum and of the ethmoidal cells as the cause of her ocular trouble. The history in this case led us at the outset to suspect disease in the teeth or in the pelvis of the left kidney. Rapid improvement followed drainage of the affected parts by her rhinologist.

I am not a nose specialist, but I am fully aware that exploration of the accessory sinuses of the nose is sometimes attended by difficulties; and we all know that it is not always possible to completely eradicate the source of infection in these cases, even by the most radical methods. In another case of mine, who has had several attacks of what one might call insidious irido-cyclitis of the right eye, and is under treatment for a further relapse, the source of infection seemed to be located in the sphenoidal sinus; for definite inflammatory disturbances (headache, discharge, etc.) were observed a year ago at this point, following an attack of la grippe. As the iritis antedated the sphenoiditis by a year, and the findings were otherwise entirely negative, I took the view that a latent inflammation had apparently been stirred up by the influenzal seizure. The sphenoidal symptoms entirely subsided under treatment, and my colleague has been loth to undertake what might prove to be a purely exploratory operation in view of the rather frail condition of the patient's general health. The present eye seizure leaves us apparently no alternative.

I am indebted to my colleague, Hamilton White, for the fol-

lowing brief summary of the question of focal infection in the tonsils:

"In determining the question as to whether the tonsils in a given case are likely to furnish a source of infection or not, there are two main points upon which an opinion may be based: first, the clinical history, and, second, the local examination of the tonsils.

"The clinical history which definitely indicates infective trouble in the tonsil, is that of recurring attacks of sore throat or tonsilitis. In such cases the condition is usually one of chronic infection, with periods of acute activity which usually indicate or follow a lowering of the general resistance from fatigue, exposure, or some other depressing influence. The history of a peritonsillar abscess is very definite evidence of infective trouble in the past, and such a case is especially likely to show persistent latent trouble. A clear history of tonsillitis is not always given, but the patient may state that colds usually start in the throat, or that they have frequently a feeling of fulness and discomfort in the throat. Swelling of the glands at the angle of the jaw is important if present, but absence of swelling is of no importance.

"The local examination in a typical case shows probably some enlargement of the tonsils, but what is much more important is the presence of retained plugs of exudate in the recesses of the tonsil. These recesses are most marked in the so-called 'buried tonsil' where a fold from the anterior pillar is adherent to the surface of the tonsil and tends to produce a recess of considerable depth. In some cases typically infective, the tonsil is small and quite hidden behind the anterior pillar. Where the superficial examination is negative, but the history points to tonsillar trouble, plugs of exudate can sometimes be demonstrated by squeezing the tonsil in a fixation forceps."

Regarding the teeth, pyorrhœa, so extremely prevalent, is probably seldom responsible for metastases, and then only in those cases in which there is a tendency to invasion of the deeper tissues, with the formation of lateral pockets giving rise to retention. The chief source of danger is to be found in the deeply situated alveolar abscess; and, as these are usually silent, an *x*-ray photograph is essential for their detection.

In May, 1915, a man, aged thirty-eight, consulted me for an iridocyclitis, and was given a most thorough systemic examination by one of my colleagues, who reported everything negative. The man's dentist declared there was nothing amiss in his field. The inflammation became more severe and secondary glaucoma developed.

I made frequent interrogations regarding the teeth, but received always the reply that they were perfectly sound. Finally, however, a pyorrhœa was reported to be present, and the man was referred to another dentist posing as a specialist for this trouble. In the end, the pyorrhœa was reported as having practically disappeared, but the ocular disturbance continued unabated. Dissatisfied, I took advantage of a trip my patient was making to the south to refer him to a well-known dental surgeon, primarily with the idea of obtaining an autogenous vaccine. An *x*-ray plate, however, taken there for the first time, revealed a large alveolar abscess; and the removal of the tooth was followed by an immediate improvement in the eye condition, and a gradual and complete recovery.

4. The reports, among others, of Brown and Irons, in which the iritis was associated with nonvenereal infections of the genitourinary tract, including two of the prostate; of Davies[5] in which the uveitis originated in a cystitis, itself in turn due to bowel infection; and of Taylor[6], where ulceration of the cervix uteri was held accountable, have made me feel that the assistance of the gynæcologist and of the urologist has not been as fully requisitioned in my work as it might have been in supposedly non-venereal patients.

5. Certainly in the absence of satisfying data, and perhaps as a routine measure, specific tests for tuberculosis will now be instituted, having regard always to the recognized contraindications.*

Inasmuch as it alone can give rise to focal reactions, the subcutaneous tuberculin injection is the only test that yields positive evidence of the disease; though, of course, as has been shown by repeated pathological examinations, an absence of a focal reaction does not exclude tubercle. Cautiously given, I have never seen a focal reaction do harm; on the contrary, in an experience that now embraces numerous cases, I have never failed to see anything but improvement follow its occurrence.

Under certain circumstances with adults, and generally with children, one must be satisfied with von Pirquet's test. It indicates only at best, when positive, that a tubercular process exists somewhere in the body. A positive von Pirquet taken in association with physical signs in other parts of the body, and negative findings as regards any other ætiological factor, is presumptive evidence of

* See Lawrason Brown, Osler and McCrae's System of Medicine, vol 1, p. 450.

the tubercular nature of an uveitis, sufficiently strong to justify a provisional diagnosis, and the administration of specific treatment as indicated. In this connexion my feeling is, that if a case of uveitis, supposedly tubercular, fails to respond to tuberculin properly given, a reconsideration of the diagnosis is essential.

Up to this point the steps of the systemic examination seem to be quite clear, and there is no doubt that failure to establish the ætiology will seldom occur if a routine such as I have outlined is knowingly followed. There are, however, a few additional avenues of investigation open in those cases in which the search ends negatively.

Judging from the numerous reports in the literature, a connexion, if not a causal relationship, exists between uveal inflammations and those gastrointestinal conditions embraced under the loose term of auto-intoxication, intestinal stasis, or intestinal sepsis; and in doubtful cases this field should be carefully worked over. It is a question, however, if elaborate metabolic tests, Barium meals, and the like are worth while. My colleagues in medicine at the Royal Victoria Hospital, with every facility at hand in the way of a laboratory perfectly equipped for work of this kind, feel that little additional information is to be gleaned beyond what is yielded by painstaking clinical examinations.

What can be done in the way of identifying the micro-örganisms in these cases by means of complement fixation tests? This subject was enthusiastically treated in October, 1915, by the late Wendell Reber, who wrote as follows:

"The laboratory findings that are now at our disposal fall under what are known as complement fixation tests, and comprise reactions as to the following organisms;

The Spirocheta Pallida (Wassermann test).
The Gonococcus.
The Pneumococcus.
The Streptococcus.
The Staphylococcus Albus.
The Staphylococcus Aureus.
The Bacillus Influenza
The Bacillus Coli.
The Micrococcus Catarrhalis.

Five of these organisms have already been shown to sustain a causative relation to iritis. The Spirocheta pallida and the gonococcus are already well known in this relation. Bradburne (*Ophthalmology*, vol. viii, page 175) has shown the streptococcus

as causative. Gray Clegg (*Ophthalmoscope*, vol. xiii, June, 1915) has recently reported uveitis going on to enucleation in which the pneumococcus was the sole organism cultured from the specimen. It is noteworthy that three other ophthalmic surgeons who saw the case with Clegg diagnosed a tubercular process. Finally I have recently reported a relapsing iritis that seems to have been due to post-influenzal toxins, Wassermann, gonococcus and all others save influenza fixation tests being negative. It responded beautifully to influenza bacterin without any other internal treatment. There is little reason to doubt that the staphylococcus family will sooner or later be similarly held on the same count."

Excluding the Wassermann test, which is not a true complement fixation test, the results obtained by Reber in a study of fifteen cases do not strike me as altogether justifying his optimism. However desirable, the possibilities at the moment of classifying our cases on the basis of diagnoses secured in this way are not good. A good deal seems to depend on the individual bacteriologist. My colleague, Dr. Bruère, while deprecating the acceptance of anything below a 75 per cent. reaction, feels, however, that complement fixation tests given by cocci (including gonococci and pneumococci) may be of some value in obscure cases, if the work is carried out with great care, and the antigens, polyvalent in character, are carefully and repeatedly tested.

One final word. It should be of equal importance in these investigations to seek out all the causes that tend to lower the natural combative forces of the body. The great majority of people carry with them, as they come and go, foci of infection, yet only a small percentage develop metastases. It is in moments of lessened resistance that bacterial processes extend. Following these lines our problem leads us into the broad fields of preventive medicine, the aim of which is to help man by placing him in a better moral and physical environment.

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THE DISEASE OZÆNA

By D. J. Gibb Wishart, M.D.,

Toronto

ATROPHIC rhinitis with its unknown ætiology and absolutely empirical methods of treatment, has long been a standing reproach to our specialty, and I propose, in the few remarks which follow, to endeavour to make you acquainted with what is being accomplished toward the elucidation of this difficult subject.

At the third meeting of the International Laryngo-Rhinological Congress, held in Berlin in August, 1911, the appointment of an international committee for the collective investigation of the disease was urged by Professor Alexander, and it is interesting to note that of the three gentlemen appointed on that committee, Professor Alexander alone survives. This committee entrusted the investigation for Great Britain to the hands of Dr. Brown-Kelly of Glasgow, and work in the United States was put in the hands of Emel Mayer of New York. Schedules were sent out to the various gentlemen appointed in charge of districts in Great Britain and Canada upon which records could be taken of the cases which presented themselves for examination; instructions were given that school children, inhabitants of orphanages, asylums, refuges, etc., be thoroughly examined and thus statistics arrived at that would show the proportion of cases according to the population, together with their land of birth, etc. This schedule took up the following points: —

1st. General, including name, origin, etc.
2nd. Clinical history.
3rd. General bodily condition.
4th. Conditions found in the upper ear passages, inclusive of the measurements of the skull, palate, etc.
5th. Complicating affections.
6th. Heredity or infection.

In number three, the examiner was requested to obtain a Wassermann.

Owing to the expense of the last named examination and the great amount of detail covered by the schedule and the ex-

pense involved, the committee in the United States made little progress and presently abandoned the task. The work was carried on in Britain through certain funds that were contributed, but in Canada very little progress was made.

It was intended that the report should be presented at the Fourth Congress, which was to be held in Hambourg in 1915, but the war has prevented this being held, and stopped, it is presumed, the work at every point at which it has been taken up.

In 1899, Dr. Fernando Perez of Buenos Ayres, described in the *Annals of the Pasteur Institute* a small polymorphous, gram-negative immobile rod as the existing cause of Ozæna, and termed it the "Cocco-bacillus fœtidus ozænæ". Although followed by several other articles, his report received scant attention, and it was not until 1913 that his results received confirmation after being submitted to the Institute of Sero-Therapeutics of Vienna, and in November, 1913, he read a paper on the subject at the meeting of the Berlin Laryngological Society. In this paper he stated that he recognized ozæna as a family disease and that moreover it was infectious. He then described the method in which he isolated the Perez bacillus, the cultures of which gave rise to a specific, characteristic odour exactly similar to that of the disease. Injections of one quarter ccm. of a bouillon culture into the marginal skin of the ear of a rabbit caused death in twenty-four hours. At death, the changes were found in the nasal passages and consisted in inflammation of the mucous membranes of the turbinates, especially the anterior which corresponds to the inferior in man. Bacteriological examination revealed the presence of the injected organism.

Contagiousness had been investigated clinically, and ninety-three cases had been found in which the disease had been transmitted from one member of the family to one or several other members, and thirty cases in which the disease had been contracted by coming into contact with subjects of ozæna, but were not members of the same family.. He also had proved bacteriologically and clinically that the disease might be transmitted to man by the dog, and that the cocco-bacillus of ozæna occurred normally in the dog's nose and increased in those suffering from distemper.

Attention being thus drawn to the Perez discoveries, an investigation was taken up by Hoffer of Vienna who entered into a very complete study of experiments. He found great difficulty in isolating the Perez bacillus owing to the great variety

of organisms present in ozæna crusts. He, with Koffer, tried a vaccine obtained from strains from seven different cases of the disease, which was used subcutaneously in doses of ten to five hundred million organisms weekly. In these cases, a nasal reaction was observed, acute cold in the head with marked pulsation, epistaxis, redness of the nostrils, etc., and in some cases flushing of the face and feeling of heat in the head, headache, frontal pain, etc. Sooner or later a diminution or complete cessation of the fœtor was observed.

These investigations of Hoffer were carried on during 1914, at which time there were working in his laboratory in Vienna three American gentlemen, one of whom was Dr. Henry Horn of San Francisco. These gentlemen were obliged to leave Vienna on account of the war and brought with them a number of cultures, and ever since Dr. Horn has been carrying on an extended investigation of the Perez bacillus and observing the result of treatment of cases with vaccines. His preliminary report was presented before the American Medical Association at San Francisco in 1915. In this report he points out that Hoffer had seemed to be unduly optimistic about the results of his investigation. The isolation of the organism proved to be exceedingly difficult, and many of his vaccine experiments have been failures. In this connexion he described the method of examining the noses of the rabbits which had been injected with the organism cultures and the method of obtaining cultures from patients in the clinic. A crust was taken from the nose preferably at the anterior end of the middle turbinate. This was incubated in bouillon for twelve hours and then spread on agar petri dishes for twenty-four hours' incubation, and then fished and transferred to agar slants. The characteristic odour was developed after twenty-four hours. The agglutination test was not a success. It was found that many of the cases which clinically were true ozæna did not possess the Perez bacillus, but did possess the Friedländer, and the first point made in this preliminary statement is that ozæna is probably a mixed infection and that types resembling each other clinically are derived in one case from the Perez and in the other case from the Friedländer bacillus. Horn had also found it difficult to prepare antogenous vaccines. He found that the clinical manifestations were the best guide to the dosage and that this varied with every vaccine and with every patient. He narrated the history of six cases which showed marked improvement after treatment with from five to fifteen injections, namely, either from

loss of odour, the softening of the crusts, and an improvement in the feeling of tightness across the forehead. His conclusion was that the cocco-bacillus fœtidus ozænæ (Perez) answered all the bacteriological requirements as the factor in ozæna.

At the meeting of the American Laryngological, Rhinological and Otological Society, held in White Sulphur Springs, Virginia, in 1916, Dr. Horn and Dr. Victors contributed a long brochure showing the result of their work since the presentation of the preliminary report. At this time, they were able to state that their work had consisted in the more exact study of the morphological characteristics of the organism, and in an endeavour to co-relate it with the bacillus bronchosepticus and that it assumed that close relationship to the Friedländer group seemed to be fully settled in the negative. They proved that the organism was definitely motile. Clinically, they definitely divided clinical ozæna into a Friedländer and a Perez group, but were not able to differentiate the cases except bacteriologically, yet wherever a clinical diagnosis of ozæna was made, they were able to demonstrate definitely either one or other of these two groups with the predominating organisms. Turning to the examination of the cases, the sexes were about equal and Americans as numerous as foreigners. Syphilis was found in some of the cases, but the antisyphilitic treatment had no effect upon the ozæna, and they believed it played no role in the ætiology. The entire membrane of the nose, included with the accessory sinuses was found to be affected, and the Perez bacillus in pure culture was obtained from the sub-mucous tissues by painting the pure tincture of iodine upon the cocainized turbinate and puncturing through this area.

The doses administered began with two hundred million, repeated every twenty-four hours until there were symptoms of reaction, the dose being doubled each time. The dose which caused the reaction was considered the minimum therapeutic dose, and this was given every seventy-two hours. Improvement was discovered after the fourth therapeutic dose, and the first course consisted of twenty injections. No evil effect was seen in children from these large doses.

Horn and Victors, in this article, deal carefully with the adverse results obtained by Burckhardt and Oppikofer, who were experimenting also with Hoffer's strains.

They stated that in size, shape, tinctoral reaction and motility the bacillus bronchosepticus and bacillus Perez are almost identical.

At the recent meeting of the American Laryngological, Rhinological and Otological Society, in Atlantic City, I had the pleasure of listening to a third contribution from Horn, giving details of his past year's work. He definitely confirmed his findings of last year with reference to the close resemblance of the bacillus bronchosepticus to the bacillus Perez, and gave the results of continued observation of the cases reported in the previous articles which had been treated with the vaccine. He still considered that the therapeutic effect of the vaccines was satisfactory and considered a number of them as clinically cured in that they were free from odour, practically free from crusts, and able to attend to their duties without feeling that their presence was annoying to their companions. He did not find, however, that these cases were bacteriologically cured, namely, that it was impossible to detect the presence of the Perez bacillus, and moreover it developed in discussion that these patients required the use of a douche occasionally.

Discussion of the paper was taken part in by Professor Miller of the Minnesota University, and Dr. Dwyer the pathologist of the Manhattan Eye and Ear Hospital. Neither of these gentlemen agreed with Dr. Horn. Professor Miller objected: First, on the score that it was not proven that the rabbits used to obtain cultures had not previously suffered from the disease, and, second: that the formation of crusts in cases that had been treated over three years and the presence of the Perez bacillus in these cases indicated the non-specific character of the vaccine employed. Dr. Dwyer did not go so far in his opposition to Dr. Horn's findings as did Professor Miller, who expressed grave doubts as to whether we were yet upon the right track with reference to the ætiology of this disease.

I have endeavoured to make you acquainted with the work that is being carried on in this country, both in order that some of you may be encouraged to undertake experiments for yourselves, and that you may recognize that scientific investigation in nose and throat disease is not a stranger to this continent.

It seems definitely proven by the results obtained by Dr. Horn in the forty odd cases with which he dealt in his papers, that the cases which we have classed together as ozæna, do not all arise from the same cause, and that even if the Perez bacillus be not the true ætiologic factor in the spread of this horrible disease, the use of vaccines is capable of assisting our patients more satisfactorily than any form of treatment which has hitherto been tried.

VESICAL SYMPTOMS IN RENAL DISEASE A PRELIMINARY REPORT FROM THE DEPARTMENT OF UROLOGY ROYAL VICTORIA HOSPITAL MONTREAL

By D. W. MacKenzie, M.D.

IT is well recognized that frequent, painful urination, hæmaturia and pyuria are among the symptoms of renal disease, but that one or more of them may be the only subjective signs, does not seem to have received sufficient recognition by the profession in general.

The history from practically all our patients of prolonged bladder irrigation for so-called cystitis, and several suprapubic cystotomies for supposed surgical conditions of the bladder in patients suffering from some form of infection in their upper urinary tract has led us to again bring this subject before the profession. The renal conditions which are most frequently the cause of vesical symptoms are: Tuberculosis, pyonephrosis, pyelitis, and renal and ureteral calculi.

Renal tuberculosis. That the presence of renal tuberculosis is usually recognized through the irritability which it causes in the bladder is a fact frequently disregarded. It has been said "that for the best interests of the patient, it would be well to regard every case of diurnal irritability of the bladder, persisting over a period of several months, and accompanied by more or less pyuria, as due to renal tuberculosis until it can be proved otherwise".

All our patients with renal tuberculosis came complaining chiefly of frequent painful urination by day and night; some had intermittent pain in the bladder region; many had at some time or other passed little or more blood; all had pyuria; tubercle bacilli were demonstrated in most of the cases; and only a few had slight discomfort referred to the kidney region; all gave a history of definite symptoms of bladder irritation for from four months to four years.

Read at the forty-eighth annual meeting of the Canadian Medical Association Montreal, June 15th, 1917.

Braasch, from the Mayo Clinic, from an extended period reported two hundred and twelve cases operated upon for renal tuberculosis; of these seventy-one per cent. had vesical symptoms for more than a year; thirty-seven per cent. over five years.

It is needless to say that for the best interests of the patients such cases should come to operation long before these lesions become so advanced. Early recognition of the disease not only improves the prognosis, but, what is more important, it may prevent the unfortunate deep-seated infection of the bladder—the bane of the post-operative treatment of tuberculosis of the urinary tract. This is especially true in the male where the prostate complicates conditions.

Hæmaturia was only found in male patients, perhaps because it generally comes from bladder ulceration which is often more marked in the male than in the female.

Pyonephrosis. Advanced infection of the kidney naturally causes more or less infection of the bladder, and more or less symptoms of cystitis. The vesical symptoms are, however, often not so pronounced as in tuberculosis, but when the cystitis is severe, the infection unilateral, and the urine from the infected side grossly purulent, the symptoms from the two conditions closely resemble each other. On the other hand general infection of the kidney may occur with purulent urine, and only slight involvement of bladder mucosa with mild vesical symptoms. Localizing symptoms referred to the kidneys rarely occur except from complications such as kidney retention, etc., the irritability of the bladder alone calling attention to the presence of kidney infection. All our cases of pyonephrosis complained of frequent urination with pyuria, and several were treated for either so-called cystitis or gonorrhœal prostatitis for periods from two months to four years.

Pyelitis. Infection of the renal pelvis necessarily occurs together with infection in the adjacent renal tissue and in the ureters and bladder. Practically every case of pyelitis is accompanied by more or less cystitis, although not every case of cystitis is accompanied by pyelitis; I feel the majority of cases of cystitis will be found to be the result of renal infection. Particularly is this true of the male, where, with the exception of those infections localized to the base of the bladder extending from a urethritis, or resulting from local irritation, urinary obstruction or trophic disturbance, a pyelitis may be demonstrated in every case. In the female, however, cystitis will be found much more frequently without any demonstrable renal involvement, particularly that

chronic type of cystitis so frequently found, and which is characterized by mild chronic inflammation of the trigone and vicinity, and generally accompanied by more acute subjective symptoms than the findings warrant. However, when the bladder is extensively involved renal infection may be demonstrated in the majority, if not in all cases.

All of our cases of pyelitis gave evidence of bladder irritation with frequent urination, and most of them complained of bladder pain. Several also complained of symptoms referred to the kidney region. In all coli communis bacilli were found on culture.

Nephrolithiasis. Most, if not all, patients with renal calculus give a history of frequent urination with more or less pyuria, and many of them are treated as cystitis *per se.* One of our patients had bladder lavage intermittently for years. Tenderness on deep pressure in the costo-lumbar angle is always suggestive of infection with kidney tension, retention, or stone. During colic, resulting from urinary obstruction in kidney or ureter, irritability of bladder and frequency are often prominent symptoms, and may be the chief point in differential diagnosis; in fact, the absence of vesical irritability coincident with pain would be a factor in exclusion, in the interpretation of a doubtful renal or ureteral shadow. The so-called classic symptoms of renal calculus—hæmaturia, renal colic and kidney pain—are so often absent as to be a negligible factor in arriving at a proper diagnosis.

Ureteral calculus located in the lower ureter generally gives symptoms of bladder irritation, and the pain from any ureteral calculus may be referred to the bladder, scrotum, or thigh. When the stone is lodged in the vesical portion of the ureter the pain is often referred to the neighbourhood of the bladder neck and the vesical irritation may be persistent. We have frequently found rather constant pain in the suprapubic or lower inguinal region following the passage of a more or less impacted stone from the lower third of the ureter. This, I believe, is caused by a localized periureteritis, the result of ulceration in the ureteral mucosa. Of our nine recent cases of ureteral calculi four complained of intermittent frequency; of these all had their stone in the lower third of the ureter. Only one had pus in the catheterized specimen of the urine.

No so-called cystitis should be regarded as such without a careful exclusion of possible renal infection. The treatment of these patients by internal medication supposed to have urinary antiseptic action, or worse still, operation on the bladder or fe-

male pelvic organs is strongly to be condemned unless a careful investigation has first been made to exclude the presence of any ætiological renal infection. Although a large proportion of cases of cystitis are the result of renal infection, it should not be stated that cystitis may not exist as a primary and sole focus of infection of the urinary tract, this is particularly true of the female, but our findings seem to show that they are relatively few.

Of one hundred and thirty-six patients recently referred to us for urological examination, one hundred and nine complained of vesical symptoms: of these thirteen proved to be renal tuberculosis; five pyonephrosis, unilateral; two bilateral; six bilateral pyelitis; two hydronephrosis from obstruction of the ureter; four renal calculus; nine ureteral calculus; four ureteritis from calculus; two tumour of the kidney; two double ureter, one with impacted stone and pyonephrosis; five vesical calculus; two diverticulum of the bladder; eight tumour of the bladder; ten prostatism; one carcinoma of the prostate; two perivesical adhesions (post-operative); one congenital horse-shoe kidney; seven cystitis; three trigonitis; nine chronic prostatitis; ten chronic interstitial nephritis; four urethral stricture; and twenty-five no urinary lesion.

The simplest way to determine the presence of renal infection obviously is by ascertaining the presence of pus in the urine catheterized from the respective kidneys, and the determination of the organism by smear or culture. The amount of pus in these specimens may vary considerably, depending on the stage of infection at the time of examination. Indeed during dormant intervals only occasional pus cells may be found; at such times bacteriological examination of the catheterized urine will often give evidence of the renal infection. The finding of no pus at a single renal catheterization would therefore not exclude the possibility of a quiescent renal infection. Renal functional tests often aid greatly in determining the presence and extent of such conditions. Phenol-sulphone-phthalein and urea are particularly suitable, perhaps because the one dovetails so well into the shortcomings of the other. It has long been recognized that tuberculosis of the kidney, pyonephrosis, hydronephrosis, etc., give diminished renal functional output, indeed the extent of the involvement of the kidney tissue can often be well estimated by the amount of the patient's phthalein output.

Infection of the renal pelvis and ureter is followed by dilatation of the walls as the result of cicatricial change. Demonstration by pyelogram of such dilatation in the outline of the renal

pelvic or ureter would be conclusive evidence of previous active infection, even though the urine failed to show any evidence of active infection on microscopic examination. A pyelogram moreover may be of value in the differentiation between infection involving the pelvix, and that involving the parenchyma, determined by changes peculiar to each.

As a working basis for the staff, we have adopted the following as routine in examination of such patients admitted to our service:

1. History:
   General
   Urological—Pain
   Frequency
   Hæmaturia
   Cloudy urine
   Cystals and Calculi
   Previous treatment.
2. Physical Examination:
   (a) General
   (b) Urological—Inspection—Tumours, urethral discharge, œdema, malformations, etc.
   Palpation—Bimanual of renal regions, tenderness, muscular spasm, tumours, varices. Rectal—prostate vesicles—size, contour, consistency, fixation and tenderness.
   Exploration of urethra with soft catheter. Residual urine.
   Capacity of bladder.
   Blood count and smear.
3. Urinalysis.
4. Renal function (1 c.c. phenol-sulphone-phthalein intramuscularly):
   Appearance time . . .
   First hour . . . . . per cent.
   Second hour . . . . . per cent.
5. Blood culture (septic cases).
6. *X*-ray.
7. Cystoscopy:
   Urethra
   Bladder mucosa—cystitis, ulceration, trabeculation, diverticulum, neoplasm, calculus.

Ureteral orifices—Size, shape, position and function.
Ureteral catheterization—

	Right	Left
Macroscopic	. . . . .	. . . .
Volume	. . . . .	. . . .
Urea	. . . . .	. . . .
Urea—Volume	. . . . .	. . . .
Microscopic	. . . . .	. . . .
Smear	. . . . .	. . . .

Culture: (Lab. No. . .)
Guinea-pig inoculation (only occasionally done)
Comparative Function (1 c.c. phenol-sulphone-phthalein intravenously)

	Right	Left
Appearance time	. . . . .	. . . .
Amount in 10 minutes	. . . per cent.	. . . per cent.
Amount in bladder at close	. per cent.	(Leakage)

10 c.c. indigo-carmine intravenously (when necessary) to locate internal openings.
(Obstruction to catheter.)
X-ray catheters—pyelogram
Wax-tipped catheters } where indicated.

8. Treatment.

The Illinois Vigilance Association has issued four pamphlets on the problem of venereal diseases for inexpensive or free distribution. The Association is a welfare organization, is incorporated, and is not for profit. The pamphlets, four in number, are entitled: "Lord Kitchener's Instruction to Soldiers," "Three Great Army Records," "For Our Sons," a translation from the French by Prof. Alfred Fournier, "For Our Daughters," by Dr. Charles Burlureaux, member of the Society of Sanitary and Moral Prophylaxis of France. Both "Three Great Army Records" and Prof. Fournier's pamphlet contain unusual and extremely valuable information. Lord Kitchener's "Instructions" greatly improved conditions in India, while the pamphlet, "For Our Daughters," treats in an excellent manner a difficult problem.

ABDOMINAL SURGERY AS A FACTOR IN THE TREATMENT OF PULMONARY TUBERCULOSIS

By Norman H. Beal, M.D., F.A.C.S.

Associate Professor of Surgery, Medical Faculty, Western University, London, Ont.

THE coëxistence of pulmonary tuberculosis with other pathological lesions is a factor recognized by all pathologists. In some instances the chest condition is the dominant factor; while in other cases the lung condition is of minor importance, being overshadowed by the coëxistent pathological lesion. Though attention has been drawn to this by several writers, [1], [2], nevertheless the significance of this fact is not sufficiently recognized in its clinical bearing. Once a patient develops a recognizable tuberculous lesion there seems to be a tendency on the part of many practitioners to attribute every symptom subsequently developing, to the tuberculous process, while, as a matter of fact, this is often not the case. In not a few instances serious consequences follow the failure to recognize the significance of these nontuberculous manifestations in tuberculous patients.

The following considerations of the surgeon's viewpoint in such cases where the coëxistent factor was an abdominal lesion are offered as a result of the writer's experience with a series of cases presenting this dual condition.

Acute Abdominal Lesions. The surgeon is called in consultation from time to time in cases of active pulmonary tuberculosis undergoing treatment who have developed an acute abdominal condition which under ordinary circumstances would call for immediate operation. These cases tax the judgement of the consultant to the utmost. They are obviously poor operative risks; and, with the often added opposition of the attendant physician to surgery in such cases, one hesitates to advise surgical intervention. When, however, this seems imperative, and is undertaken, the results are occasionally not all that might be

Read at the forty-eighth annual meeting of the Canadian Medical Association, Montreal, June 13th, 1917.

wished. Nevertheless in the great majority of carefully selected cases, the operative ordeal is well borne, and the marked and rapid improvement following subsequently in the chest condition is very striking indeed.

The conclusion seems obvious that the abdominal condition has been a deterrent factor to such an extent that the pulmonary tuberculous condition could not be arrested or overcome. This class of case occurs frequently in patients undergoing institutional treatment for pulmonary tuberculosis. The cases of this character we have seen were all cases of acute appendicitis.

Chronic Abdominal Lesions. Another group of cases has been studied, namely, institutional cases presenting a subacute, or chronic, abdominal condition, manifested by attacks of abdominal pain and vomiting. These attacks are always followed by loss of weight, in the cases we have seen, equal to the amount gained in the interval between attacks. Surgery in such cases was not imperative, but rather a matter of judgement as to whether the removal of the abdominal condition would be followed by improvement in the chest condition. As examples of this type of case we have seen two cases of cholelithiasis, four cases of chronic appendicitis, one case of gastric ulcer, one case of tuberculosis of the cæcum, two cases of tuberculous peritonitis, and one case of tuberculous salpingitis.

In two cases of pulmonary tuberculosis in women with uterine fibroids, uterine hæmorrhage seemed to be a potent factor in keeping the patient's condition below par, and operation was undertaken on this account.

Many of these cases were patients in the Queen Alexandra Sanatorium, under the direction of Dr. D. A. Craig, with whom they were studied.

Our acute cases all did well; one after a stormy convalescence. All showed much more rapid improvement in the lung condition following operation than they had made under the same institutional regime before operation. With two exceptions, the chronic cases have been operated on, with the following results, which we consider justified in the majority of instances, our hopes that the removal of the abdominal factor would enable the patient to overcome more effectively the pulmonary condition.

In the two cases of cholelithiasis and four cases of chronic appendicitis, so marked has been the improvement on the patients' condition, following operation, that Dr. Craig and the patients themselves feel convinced that this was the great factor

in turning the tide in the patients' favour in regard to the lung lesion. One case diagnosed cholecystitis,—but which at operation and subsequent microscopic examination, proved to be a tuberculous appendix—did badly. The lung condition was obviously aggravated by the anæsthetic, and the patient had a marked exacerbation of the tuberculous process, with distressing cough. The wound broke open, down to the peritoneum. With careful nursing the wound closed after nine weeks, and though the patient had no return of her abdominal trouble, which had given much previous discomfort she eventually died of her tuberculous condition.

The cases of tuberculous peritonitis were as follows: One, apparently of the ulcerative type, has not been deemed a case suitable for operation. In the case of a girl of sixteen, primarily an early pulmonary case, later developing the acute form of tuberculous peritonitis, operation was undertaken to relieve the cardiac and respiratory embarrassment. The usual procedure was followed. The abdomen was emptied of a large quantity of clear straw-coloured fluid, through a small incision, and closed immediately. No lesion was discovered in the abdomen. The chest condition improved markedly, with the patient's general improvement. Her condition remains satisfactory nineteen months after laparotomy.

In the case of tuberculosis of the cæcum, Dr. Craig and the writer both advised against laparotomy. This was, however, performed elsewhere. No benefit followed, the patient dying two months after.

The cases of uterine fibroids following hysterectomy did splendidly. In both, the lung condition has remained arrested.

In one, a school teacher of thirty-eight, the hæmoglobin continued to drop till it reached thirty-six per cent, in spite of vigorous treatment. A transfusion of 620 c.c. of blood from a sister was given three days previous to hysterectomy. Thirteen weeks following removal of the uterus the hæmoglobin was seventy-six per cent., her weight had increased eighteen pounds, and she had become afebrile. She is one of our most satisfactory results, as the outlook previous to operation was very grave.

The case of tuberculous salpingitis has not been long enough under observation since operation to claim anything for it. Her condition at present is, however, satisfactory.

No mention is made of more radical procedures, such as resection of tuberculous intestine,[3] short circuiting,[4,5], etc., which

have been successfully performed by some surgeons in these cases, as any such cases we have seen did not appear to be suitable for surgery.

In regard to this group of chronic cases it would appear that abdominal pain, interference with the digestion and nutrition, and hæmorrhage, when due to abdominal or pelvic lesions and accompanied by loss of weight or a failure to gain, are determining factors in keeping the patient suffering from cëexistent pulmonary tuberculosis, below par; and the removal of the abdominal lesion is followed by marked improvement in the lung condition.

In undertaking surgery in these cases every detail should receive careful consideration as the result may finally depend on apparently minor factors. Among these are the following:

(a) *Place of Operation.* It is advisable when possible to operate upon these cases in the sanatorium where they are being treated for the lung condition, rather than in a general hospital. Dr. Craig is having a small operating plant installed in the new Reception Hospital of the Queen Alexandra Sanatorium, and we believe this might be imitated elsewhere with advantage to the institutional case who may need surgical treatment.

(b) *The Time to Operate.*—This is an important question. In acute cases no choice is given. In chronic cases, however, who have shown a tendency to improve and relapse, the tide of improvement should be taken at the flood, and before relapse sets in the operation should be performed.

(c) *Preparation of Patient.* Most surgeons are against purging and starvation in any operation, but in these cases there can be no room for discussion. The diet should not be restricted except the meal previous to operation, when clear broth should take the place of this meal. The bowels should be opened only with a laxative. In some cases an enema alone is preferable.

(d) All details of the operation should be carefully planned so that no time is lost, which is an important element in these cases. The patient should be carefully guarded from exposure during the operation and in the corridors to and from the operating theatre if recovery rooms are not close at hand.

Iodine preparation of the field of operation is preferable to chilling the patient's body with various solutions.

(e) *Anæsthesia.* Ether is certainly not the anæsthetic for these cases. Nitrous oxide is the best general anæsthetic and if it is not available, chloroform carefully administered.

The anæsthetist should protect his hands by wearing rubber

gloves in these cases. This is very important as the expectoration during anæsthesia from open pulmonary cases is a source of danger which should be guarded against.

(f) In the after-treatment the physician should share in the direction of the case. Nourishment should be commenced at the earliest moment possible, and pushed vigorously. Fresh air and sunlight should be withheld only until the patient recovers from the narcosis. Hence the advantage of the facilities for operating in sanatorium rather than caring for these cases in general surgical wards.

Conclusions

1. In cases where pulmonary tuberculosis coëxists with an abdominal lesion, the lung lesion is often greatly influenced by, and in some cases is of secondary importance to the abdominal lesion.

2. In carefully selected cases where the pulmonary condition fails to improve and this seems due to the abdominal factor, discriminating surgery is an important aid in the treatment of the case.

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Private Beesley is an example of the wonderful surgical skill demonstrated at the front in the present war. He was a pianist before he became a soldier and had the right thumb shot away. The injury has been rectified by transplanting a finger on the place where his thumb had been. The King was personally interested in the case and paid him a special visit at Reading, England.

REPORT OF THE SPECIAL CLINIC FOR THE TREATMENT OF SYPHILIS, TORONTO GENERAL HOSPITAL

By E. J. Trow, M.B.

Assistant Dermatologist Toronto General Hospital; Instructor in Dermatology in University of Toronto

IT is difficult to obtain any accurate estimate of the prevalence of syphilis in Ontario as a whole, but, in isolated sections of the province some idea of its activities has been obtained by the use of a routine Wassermann test. In the indoor services of the Toronto General Hospital following the routine test the percentage was found to be twelve, which, of course, includes all public services. As a routine test is not done in the out-door department, it is difficult to arrive at any conclusions as to its prevalence there, but, from a survey of the hospital records and the books of the clinic some idea is gained.

The special treatment clinic was formed in December, 1915, and in the eighteen months has grown rapidly. During the first month the clinic had ninety-six visits, whereas in April, 1917, eighteen months later, the total visits were four hundred and ninety-six. The relation of the special treatment clinic attendance to the total out-door attendance during April, 1917, is 15·4 per cent. or four hundred and ninety-six to 3,255, or a ratio of 1–6·5. It has been the policy of the hospital to refer all cases of syphilis to this clinic for treatment and it is very interesting in this connection to notice the great variety of presenting symptoms showing the many phases the disease may assume.

Referred by

Direct	168
Medical clinic	59
Indoor services	46
Dermatology	36

Paper read before section of Medicine of the Ontario Medical Association meeting June, 1917.

Eye	33
Ear, nose, throat	27
Surgery	26
Genito-urinary	25
Psychiatric clinic	20
Neurology	17
Tuberculosis	17
Gynæcology	14
Semi-private	10
Social service	10
Gastro-intestinal	1
Board of Health	1

Five hundred and eight cases appear on our books, there being male, two hundred and sixty; female, two hundred and forty-eight.

The ages varying from almost infancy to sixty years and over, being as follows:—

Under five years	3
5 years to 10	9
10 " 15	10
15 " 20	57
20 " 25	90
25 " 30	99
30 " 35	75
35 " 40	64
40 " 50	66
50 " 60	20
60 years and over	15

Four-fifths of these cases, however, as is easily seen, were between 15 and 40 years of age.

Married	309
Single	192
Widows or widowers	7

The nationality is rather interesting, as it shows a rather high percentage among our foreign-born.

Canada (few from U.S.)	238
England, Ireland and Scotland	157
Foreign-born	113

While it is impossible to attempt to classify such a disease as syphilis, which is simply one and the same progressive infectious fever of a chronic type, yet, for the sake of statistics we have attempted to do so, with the following result. In all cases attending the clinic we have always attempted to ascertain, if possible, the source and date of infection, but in many it was quite impossible to obtain the data bearing on their infection. This seemed to be especially true in women.

Stage of disease:

Primary, 35 or	7·05	per cent.
Secondary, 105 or	21·17	"
Tertiary, 323 or	65	"
Latent, 35 or	7·05	"

Of these cases, the probable source of their infection fell under the following heads:

Giving a history of a primary sore, 226 or	46·33	per cent.
Giving a history of urethral discharge, 44 or	8·87	"
(7 gave history of both).		
Probable extra-genital infection, 13 or	2·82	"
Giving history of congenital infection, 21 or	4·31	"
Giving history of conceptional syphilis, 40 or	8·06	"
Primary infection unknown, 112 or	22·58	"
No date, as history incomplete, 38 or	7·66	"

One hundred and thirty-six cases were able to give the exact date of their infection, and the long lapse of time between the initial inoculation and its later and more serious manifestations shows quite clearly the long periods of latency which exist in many.

History of Primary sore:

1890–1900	22
1900–1905	15
1905–1910	21
1910–1913	14
1914	9
1915	15
1916	45
1917	13

As is easily seen in the preceding figures, on account of the variety of the manifestations which may be present in such a disease as syphilis, I would like to emphasize the importance of the Wassermann reaction, for, without its valuable aid, a great many of our cases would have gone on unrecognized, and, in fact, one might almost say that in any given case where the diagnosis is not perfectly plain, our patients should not be denied its valuable aid. Medical men are now just as much to blame for failure to recognize syphilis as they are in any other common ailment. The clinical types of cases which we see almost every day are legion, and in many of them the diagnosis is clear, but many more are puzzling indeed. The primary inoculation, for instance, may be on any part of the body and no longer do we look at a sore and wonder if it may not be a syphilitic one, but we immediately start to prove or disprove it by the use of the dark field or some other stain for spirochæte. The more of these lesions we see, the more we think that no text-book description fits all or nearly all of these primary syphilitic sores. Of the secondary cases, while many of them presented rashes, polyadenitis, headache, fever, malaise, rheumatic pains, pharyngitis and so on, yet many were not so plain. The various eruptions in many cases resembled such diseases as scabies, the pus infections, impetigo and echthyma, psoriasis, eczema, lichen planus and many others. The frequency of headache early in the disease is of considerable importance as it definitely points to a meningeal irritation and, as we now know, it is during the early period of the disease that the foundation is laid for a serious attack on the various internal organs. Syphilis being such a chronic infectious fever, appears to have its periods of rest or so-called latency, yet it tends to progress steadily but sometimes slowly, and very few of these neglected untreated cases escape the consequences of its later manifestations.

In the mouth, mucous patches are frequently seen, the pharyngitis; several of our cases presented a chancre on the lips and, quite recently, we were able to demonstrate the primary infection on the tongue, the origin being, in all probability a dental instrument. In the later stages an interstitial inflammation of the tongue is not rare with its deep fissuring, tenderness, and occasional ulceration. Gummatous infiltrations are often seen about the mouth and throat, and occasionally one sees perforation following these gummata, through the palate.

The larnyx in early syphilis sometimes presents a subacute catarrhal condition giving the patient that peculiar hoarseness of

voice. The lungs are probably more frequently involved than we think and seventeen cases referred to us from the tuberculosis clinic gave a positive Wassermann test, the clinical signs being cough, and, sometimes hæmorrhage. Many of these cases have improved under treatment with anti-syphilitic remedies, so that it seems certain that syphilis and tuberculosis may sometimes exist in the same patient.

We find the different parts of the circulatory apparatus very frequently affected, the usual long period of time lapsing between infection and evident lesions. The spirochæte being deposited in the wall of the vessels in the secondary stage does not produce clinical signs for a number of years, and so that symptoms, such as dyspnœa, precordial pain, attacks of angina pectoris and aortic insufficiency call for a Wassermann test for the relation of aneurism to syphilis is now well known. Not only the heart and larger arteries may suffer but also the smaller ones from a gummatous arteritis, which is so often responsible for many of the signs in cerebro-spinal syphilis. Syphilis of the bones is not uncommon and many such cases have presented themselves to us, usually showing as an osteomyelitis or gummatous periostitis; however, these cases are more common in the congenital variety.

In family syphilis, we have our greatest menace and the results there show only too well its effects on the race; many of our female cases with history of miscarriages, born dead, and babies dying in infancy proves how seldom it is that the child escapes its consequences unless treatment is early.

Congenital syphilis is syphilis acquired in intra-uterine life, the placenta playing the part of a primary lesion. Aside from the classical symptoms of congenital disease, its effect may cause all sorts of anomalies of development.

I would like to thank Miss Grant and the social service department for making this report possible, and also the ladies of the out-door staff for their valuable aid.

TREATMENT OF SYPHILIS. REPORT OF SPECIAL CLINIC FOR SYPHILIS, TORONTO GENERAL HOSPITAL

By W. T. Williams, M.D.

Toronto

SINCE the discovery of the organism responsible for syphilis and the serum reaction of Wassermann, soon followed by Ehrlich's experiments in the action of arsenical compounds, treatment of this disease has undergone a radical change and can now be said to be on surer foundation and possibly in the way to its practical elimination. While only a few years ago, diagnosis of the disease was only possible by an intelligent interpretation of its superficial lesions along with the history of the case, we are now enabled to identify an initial lesion with every degree of accuracy by obtaining a drop of serum from the sore and recognizing the spirocheta by means of the dark field or one of the stains. In later stages of the disease, if the diagnosis is in doubt, the Wassermann reaction comes to our aid and in 80 to 95 per cent. of the cases, this is made clear. In congenital syphilis, some writers claim the Wassermann test is 100 per cent. efficient. (Smith, N.Y.)

The diagnosis clear, what is the best line of treatment? In the special clinic at the Toronto General Hospital, we begin most of the early cases or those showing superficial skin lesions or any cases presenting an evident activity of the disease, with intravenous injections of one of the arsenical compounds, viz.: diarsenol, galyl or novarseno-benzol—provided no contraindications are present such as serious arterial disease, acute nephritis or advanced degeneration of the central nervous system. It is usual to begin with small doses and gradually increase to 0·6 grm. or 0·7 grm., though if the patient is a robust adult, 0·6 grm. is given at the start and repeated weekly for six to ten doses. A Wassermann test is made following each injection. If the case is one with a primary lesion, we frequently find a negative Wassermann after four to six injections, but continue treatment until two consecutive tests are negative. The patient may then be requested to report in a month and if his blood test still remains negative, is advised to report again in two

or three months or sooner if any symptoms intervene. We advise every patient to remain under observation for at least two years.

One of the important signs showing when the limit of toleration is reached in treatment by arsenical compounds, is a slight dermatitis, intensely red, which we have often first noticed appearing on the wrists and forearms. When this appears, it is not well to push the diarsenol. This precaution was not observed in one case and a further treatment given. The result was deplorable and that patient still remains in the hospital slowly recovering from one of the most severe cases of exfoliating dermatitis and was so ill that at one time her condition was critical. Another case showed some redness about the wrists after three doses of diarsenol and we refrained from further treatment, but she has had a mild dermatitis on the wrists and forearms for several weeks. Still another case, after one 0·3 grm. and one 0·45 grm. dose, was ill in bed for one week, having quite a severe dermatitis on the forearms, chest, neck, and face. A. G. had seven 0·6 grm. doses between September 15th and October 25th, and developed a rather severe dermatitis of the arms, axillæ and groins by November 6th. However, if a careful lookout is kept for a roughening and reddening of the skin of wrists and forearms, the more severe forms of dermatitis may mostly be avoided.

If after a certain number of diarsenol treatments (say six to ten), the patient fails to give a negative Wassermann, he is put on a course of mercurial intramuscular injections. In the clinic, we give doses of from $\frac{1}{2}$ gr. to $1\frac{1}{2}$ gr. of mercury in the form of salicylate, Lambkin's cream, metallic mercury or calomel, injected deeply into the muscles of the buttock with a good sized needle. These are repeated weekly for eight to twenty doses unless untoward symptoms arise such as salivation, dermatitis, or albuminuria. If the Wassermann test still remains positive, another course of diarsenol is advised and this is kept up alternately with mercury until a negative test is obtained. Occasionally when the serum test fails to respond to treatment, the patient is given a complete rest for a month or two, when it sometimes happens that his blood will show a negative reaction after such remission. Along with the mercurial or diarsenol treatments, it seems of some importance, especially in the later stages of syphilis, to give substantial doses of iodides. Although it is said this has no specific action on the spirocheta, it is undoubtedly a valuable adjunct and possibly serves to liberate the organism by absorbing the surrounding deposits and thus allowing the specific remedies to act more readily.

At the special clinic, no absolute rule governs in the treatment of syphilis but each individual case is given what seems best adapted to that patient. If it is an early case and in all probability in an intensely infective condition, we use the quickest means of placing that patient in a non-infective stage, and that is by using diarsenol intravenously in as full doses as can be tolerated. It is said by many authorities that the spirocheta cannot be found in the superficial lesions nine hours after an injection of diarsenol, and certainly the relief obtained in some cases where mucous patches in the mouth and throat abound and are extremely sensitive, is most remarkable. One such case I have in mind, suffered intensely for days, even sips of water causing severe pain, and in twelve hours after the initial dose, was able to take food and drink with no distress whatever. If the case is one with no gross surface lesions but possibly has some gummatous internal growth or suffers from indefinite and obscure symptoms, we may put that patient on intramuscular injections of mercury accompanied by plenteous doses of iodide of potassium. Cases are on record in most clinics that do not respond to any medication in-so-far as the Wassermann test is applied and no satisfactory explanation of this fact has been given. Some authorities state that it is because the spirocheta had become immune to the medication or that there are different strains of spirochetæ which react differently to the treatment. Whatever the reason, many cases occur where the Wassermann test always remains positive and these cases remain uncured although no further symptoms may ever develop. However, in certain cases which constantly show a strongly positive Wassermann without apparent change, if a quantitative test is made, there will be shown a gradual improvement, as so ably shown in Dr. Detweiler's paper read before the Peterborough Medical Society in January last.

In a case first presenting itself at the special clinic, we make as complete a history as possible and endeavour, especially, to trace the source of infection. If this involves any other member of the family, we make an effort to get hold of those members either through the patient himself, or through the social service department, and ascertain whether or not they are likewise infected. A printed card is given, telling the patient what the nature of the disease is, the danger of infecting others and the importance of treatment. In this way we frequently have all the members of a family coming for treatment. If any patient fails to appear on his regular day for treatment, a card is sent by the social service, and

if there is no response to this, the patient is visited and urged as to the importance of continued treatment.

With regard to the technique, we use the gravity method with two graduated tubes connected by rubber tubing from which a single tube leads through a cotton wool filter to the needle. In one tube is put saline solution, in the other the diarsenol dissolved in freshly distilled water and neutralized with caustic soda. A tourniquet is placed around the arm above the elbow and the patient told to close his fist. This throws the veins above the flexion of the elbow into prominence and little difficulty is found in inserting the needle. After the needle is well in the calibre of the vein, the blood flows back until it is seen in the connecting glass nozzle, when the tourniquet is loosened and the clamp released, allowing the diarsenol solution to flow. When it has emptied down to the Y, the clamp is replaced and the clamp from the saline tube released. From this about 40 to 100 c.c. are allowed to flow in and the needle is then withdrawn. A very important point in the technique is to see that the needles are well sharpened and have a free flow. If the needle is dull, it requires considerable force to pierce the skin and the vein may be shoved aside or transfixed through and through, and renders the relation of the point of the needle to the hollow of the vein more difficult to gauge. It is much easier to feel that the needle is well in the calibre of the vein if it slips through the intervening tissues with little resistance.

Considering the class of cases that have been dealt with at our clinic, the results of treatment are not at all discouraging. Of the five hundred cases so far treated, only about 29 per cent. have been early, while 71 per cent. have been in the later stages of the disease. We have managed to secure negative Wassermanns on only seventy of these cases on an average of seven and a half doses of 0·5 grm. diarsenol plus four and a half intramuscular injections of mercury. Of the seventy cases, twenty-three were early and forty-seven in the later stages. Practically all of the late cases were given in addition mixed treatment of mercury and potassium iodide. Twenty-four cases had a return to positive Wassermann, thirty-five still remain negative, while eleven of them passed from our control. I may say, however, that about 80 per cent. of all cases experienced relief or freedom from all symptoms, which at any rate is encouraging.

Reactions from diarsenol are fairly frequent and occur at times while the dose is being administered. One of the most frequent is a feeling of fulness in the stomach, a full, bursting

sensation in the head while the patient becomes intensely flushed with dilated pupils and has an apparent difficulty in breathing. This, however, soon passes off and the patient is none the worse for the experience. Occasionally there is quite severe nausea which remains for a day or two. The smallest doses will cause such reactions in some patients, and we find that by placing them upon galyl or novarseno-benzol they usually are enabled to continue treatment without further unfavourable symptoms.

We have pleasure in publishing the following from the Director of the Hygienic Laboratory, Public Health Service, Washington:

"In view of the reports in current medical literature of untoward results from the use of arsphenamine and neo-arsphenamine, I have to request that you give publicity to the statement that it is requested that samples of any lots of these arsenicals which have shown undue toxicity be forwarded to the Hygienic Laboratory for examination. In sending these samples, it should be ascertained that the lot number is the same as that of the ampoules used on patients. The samples sent should, if possible, be accompanied by a brief note stating the approximate body weight and age of the patient, the dose and dilution of the drug given, the symptoms and result; that is, whether fatal or not.

National Mental Hygiene

THE MENTAL HYGIENE MOVEMENT

By Adolf Meyer, M.D.

Psychiatrist-in-Chief, Henry Phipps Psychiatric Clinic, The Johns Hopkins Hospital, Baltimore

(Ed. Note:—The following articles published by Dr. Adolf Meyer and Dr. C. Macfie Campbell on the work of the American National Committee during the last few years give much information of value to this most important cause:—"The Mental Health of the Community and the Work of the Psychiatric Dispensary," *National Committee for Mental Hygiene, 50 Union Square, New York;* "Where should we attack the problem of the prevention of Mental Defect and Mental Diseases," *No. 53, Reprints Reports of National Conference of Charities and Correction,* 1915 *Meeting, at Baltimore* "Organization of the work of the Henry Phipps Psychiatric Clinic, Johns Hopkins Hospital, with especial reference to the past year's work," *Proceedings of the American Medico-Psychological Association, 70th Annual Meeting, Baltimore, Md., May* 26–28, 1914; "The Work of the Out-patient Department of the Henry Phipps Psychiatric Clinic," *Johns Hopkins Hospital Bulletin, xxv, No.* 279, *May,* 1914; "Introduction to Special Number, *American Journal of Insanity,* containing addresses at opening of the Henry Phipps Psychiatric Clinic: The Purpose of the Psychiatric Clinic," *American Journal of Insanity, lxix, No.* 5, 1913; "The Aims of a Psychiatric Clinic," *Proceedings of Mental Hygiene Conference and Exhibit, November,* 1912; "The Problem of the State in the Care of the Insane," *American Journal of Insanity, vol. lxv., No.* 4, *April,* 1909.)

THE Mental Hygiene Movement owes its origin to the realization that the problems of mental health and the prevention of misfits and disease must be attacked beyond the walls of the hospitals which to-day deal with mental defect and mental disease. To attain this, three lines of progress are needed: More extensive training of the average physician in the timely understanding of mental difficulties; provision for early study and treatment within the means and taste of the patient; and a more sympathetic and hopeful attitude on the part of the public.

In order to get the proper medical training, it is essential that the medical centres develop model organizations for work in these lines. A medical school without provisions for the study and treatment of the minor and major mental problems produces practitioners who are not apt to keep abreast of the progress of the age. Formerly the teaching of the theory and practice of medicine left to common sense the estimate of the personality of the patient. To-day the public has a right to ask that physicians have experience and training good enough at least to render first

aid, *i.e.*, protection against procrastination, and, where special training is needed, direction to the proper physicians and agencies. Physicians must be able to save the patient from overzealous attempts to cure mental difficulties by evisceration and mutilating operations, or from expecting the salvation from one-sided procedures often leading to a mere patching up; and they must guide the patient to wholesome living before a mental healer or "new-thought" agent steps in and reaps a harvest at the expense of common sense. Dispensaries and provisions for psychoneuroses and incipient psychoses in municipal hospitals (like Dr. Carswell's wards in a Glasgow hospital or the Pavilion F at Albany, N.Y.) or actually a "psychiatric clinic" or "psychopathic hospital",—these are necessary helps in any teaching center and more and more recognized necessities in any community centre. Work with the schools, with the social agencies, and with the courts gives additional ramifications into the life of the people.

This type of work needs financial support and the moral and intellectual support of the leaders of public opinion. So far only the more glaring problems—the problem of institutions and the problem of immigration and that of feeble-mindedness—have attracted attention. It seems difficult to make the Government realize the advantages of an active and liberal policy unless public opinion and a united profession stand behind the movement. So far there has been too much of a tendency on the part of the profession to generalize personal inexperience by claiming that very little is known and done about these conditions. Physicians are apt to be arch-obstructionists. The consequence is that hospitals which have too little help get even less, and develop an attitude of resignation very unfortunate in such a difficult task.

Progress will be rather slow at best and will depend on how many local physicians are willing to band together to advocate the necessary organization and the acquisition of trained assistance. New York State has interested the health officers in the cause. In large centres there naturally develops a field for physicians who have acquired the special training which has to be added to mere intuition to do justice to the work in schools, in courts, etc.

It looks very much as if the emergencies of the war might prove one of the greatest stimuli in the great cause. Nobody can read the little book of the anatomist G. Elliot Smith and the psychologist Pear on the treatment of shell shock without enthusiasm over the new interest in a field too exclusively left to

an over-institutionalized specialty. Psychopathology will always be the chosen field of a relatively small number of physicians; but the day is not far off when every physician will want to have as much working knowledge of the technical estimation and understanding of the patient's personality and its main problems as he has now of the conditions of the blood and urine. Many failures in treatment are due to our blindness to facts, ignorance or disregard of which will rest more and more heavily on the physician's reputation as the public wakes up to the present advance in this field.

The Mental Hygiene Committee of Canada starts off with a most propitious organization at a period when everybody is wide-awake to the great emergencies of the day. Those interested in the cause in the United States will watch with cordial interest the evolution of the movement and will no doubt receive much stimulation from the impetus of live activity in the new field with its new problems and its fresh resources.

SOME NOTES ON THE FORMATION OF THE CANADIAN NATIONAL COMMITTEE FOR MENTAL HYGIENE.*

By C. A. Porteous, M.D.

Assistant Superintendent, Protestant Hospital for the Insane.

Mr. Chairman and Gentlemen:

I HAVE ventured to think that the formation recently completed at Ottawa of the so-called Canadian National Committee for Mental Hygiene would be of interest to you as its aims and purposes well deserve the unqualified support of the profession.

To the medical world there are no subjects of greater importance than insanity and its allied conditions such as mental defect, epilepsy and some of the neuropathies. An organization, designed as this now under consideration, is national in scope and activities and representative in character. It will do a great work it is

*Presented before the meeting of the Montreal Medico-Chirurgical Society, held Friday, May 17th, 1918.

hoped to advance our knowledge of, and to better our methods of treatment for those whose feet hover near the valley of the shadow, where dissolution of humanity's most precious gift—reason—too often for too long a space precedes bodily dissolution.

The origin of the Canadian Committee followed rather tardily, it must be confessed, upon the heels of what I may call the parent organization, viz.: The National Committee for Mental Hygiene of the United States. The Canadian Committee has no actual official connexion with this body, although it is to be developed on practically identical lines, and has received immeasurably valuable aid from its executive during its formative process.

The inception of the American Society was due to the efforts of one, who, being insane, had been restored. It is improbable that any movement for the uplift of one's fellows ever received an impetus from a source less accredited, or where more difficulty in turning indifference into sympathy, and sympathy into action was experienced—this, too, by one who surely might have had his path made smoother, whose entreaty deserved more hearing ears.

In 1903, Clifford W. Beers, a graduate of Yale, and a native of Connecticut, became insane. He suffered from a manic-depressive psychosis and during a period of three years received treatment in various Connecticut hospitals for the insane. His condition presented nothing unusual apparently, save in the marvellous accuracy of recollection which he retained after the attack, of the experience he had undergone in their entirety. The vagaries of the memory among those suffering from acute psychoses are remarkable enough, here one in the katatonic stupor of dementia præcox presenting the characteristic rigidities and mutism, psychic and motor negativistic tendencies and requiring artificial feeding by nasal or stomach tube daily for over three months, tells me during his convalescence quite accurately of many occurrences, during this period; another, of the alternating manic-depressive type, during six months of depression, mutism, and motor inhibition, recalls with startling clarity, countless stimuli to the various special senses throughout this superficially beclouded state; a third, restored from the maniacal phase of the same disorder recalls her destructive tendencies perfectly and her reasons therefor; *e.g.*, her tearing of sheets and other fabrics was caused by her desire to make bandages, expressed in this distorted manner: this it appeared was a part of her instruction in a St. John's Ambulance course taken previously.

These illustrations taken at random may serve to show that

memory in the insane in many acute types is retained to an almost unbelievable degree, but in the case of Mr. Beers, his memory for what took place, and the unusual sequence of these events, is noteworthy even to those of us familiar with mental diseases.

He has written a book, now in its fourth edition, which is a description of his psychosis from the unusual viewpoint of the patient, aptly calling it—"A Mind that Found Itself." It is a remarkable book, both as an auto-psychological analysis, and as a piece of descriptive literature, especially from the pen of one who prior to his mental breakdown had never even attempted writing as an employ.

This work attracted the attention of many prominent physicians, educationalists and philanthropists of the United States, and owing to their efforts the committee was formed a few years ago. As an index of the plane upon which the American Committee stands it is necessary to name but a few of its most emphatic supporters and members—Llewellyn F. Barker, president of the Society, William H. Welch and C. Macfie Campbell, of Johns Hopkins, Stewart Paton of Princeton, Charles W. Eliot of Harvard, James Cardinal Gibbons of Baltimore, David Starr Jordan of Leland Stanford, William B. Coley of New York, and Jane Addams of Chicago.

To convey an idea of the aims of the Canadian Committee, which has just been organized in a general manner, I cannot do better than to quote the official statement of its chief purposes as set forth in the Constitution, This is as follows:

"To work for the conservation of mental health and for improvement in the care and treatment of those suffering from nervous or mental diseases or mental deficiency and for the prevention of these disorders; to conduct or to supervise surveys for the care of those suffering from mental diseases or mental deficiency; to cooperate with other agencies which deal with any phases of these problems; to enlist the aid of the Dominion and Provincial Governments and to help organize and aid affiliated provincial and local societies or committees for Mental Hygiene."

It is proposed to establish local committees in the larger centres of all the provinces, under the ægis of the national body, and in this manner the work can be adapted to the more particular needs of individual communities to secure the best results.

To indicate how wide is the field and how important are some of the questions affecting with ever increasing force the mentality of the nation, that this committee can help to solve, I cannot do

better than quote Dr. Barker, of Johns Hopkins, in a recent paper on the subject. In this, speaking as president of the American Committee, he says:—

"Among the problems which might well occupy our attention are (1) the marriage of people with psychopathic tendencies; (2) the relations of puberty, of pregnancy, and of the climacteric periods to mental hygiene; (3) the pedagogic problems connected with children presenting a lower degree of educability than normal; (4) the psychology of the adult criminal and the relations that exist between crime and mental disorder; (5) the psychiatric study of juvenile offenders; (6) the coöperation of psychiatrists with the best legal talent in the revision of law codes; (7) the psychiatric study of inebriates, paupers, prostitutes and sexual perverts and a consideration of their sources, and (8) the study of the conditions, hereditary or environmental, that lead to the less outspoken instances of social mal-adjustment."

Any programme involving the study and remedy of these serious shortcomings in our social and economic system is an ambitious one, and will require all the assistance it can secure from public-spirited citizens, foremost among whom should come the medical profession, for as Dr. Barker pertinently says, "Our important task will be to bring conviction, first to medical men and later to the general public, that anomalies of feeling and abnormalities of behaviour are as much subject to natural laws as are disorders and defects of the intellectual processes. Until neurologists, psychiatrists and medical men generally come more into agreement concerning the origin of motives and the explanation of conduct, we can scarcely expect the public at large to bring their ideas of responsibility into accord with the conceptions of modern psychiatry."

Finally to turn to those things that lie nearest to hand, which all of us do when we wish to point a moral—in this case the moral is suggested by the epitome of the committee's aims previously stated—I will mention some statistics from the Verdun Hospital records. Statistics, to be interesting must be given with brevity. I will at least observe this excellent rule.

First, as to the marriage of individuals with psychopathic tendencies: Out of 4,780 admissions to Verdun Hospital in twenty-seven years, 1,884 definitely showed hereditary taint, or nearly 40 per cent. These figures take no account of 1,134 patients in whom facts upon heredity were absolutely unascertainable, and in a proportion of whom, could this have been accomplished, it is but fair to assume psychopathies in the parentage

would have been positively shown. In the remaining 1,762, hereditary tendency to mental trouble of any kind was denied, *i.e*, in only 36 per cent. was heredity actually negatived.

As to epochal periods as a factor in the production of the psychoses, our figures show that some 1,300 cases, or 27 per cent., occurred either at or about puberty, the climacteric, in the presenile period, or as a frank accompaniment of senility. With regard to defectives, some 230 have been admitted, all naturally of the more severe grades, few of whom would have offered opportunity for any but the most elementary training; these constituted nearly 5 per cent. of the total admissions.

The adult criminal, the juvenile offender, are, as yet, far from being classed as among those showing mental obliquity under the present legal system of dealing with such cases in Canada, and this is one sphere in which much can be done by the newly-formed committee; recent results in the psychiatric clinic at Sing Sing prison, established through the good offices of the American National Committee for Mental Hygiene, and conducted from 1916 to 1918, show conclusively that a very high percentage of prisoners are defective or disordered mentally. This study further shows the vital importance of the study of the individual rather than the crime.

The revision of the existing criminal law codes with the intelligent co-operation of legla tqlent and psychiatrists is greatly needed, and here it is hoped that the mental hygiene movement will be able to accomplish something. Then the law takes no recognition of grades of accountability. With our present knowledge of psychiatry and with its promises for the future I can see no insuperable obstacle to the framing of laws that would be more in consonance with that knowledge; laws that would protect society on the one hand, and on the other, for the individual, permit a wider interpretation of certain fundamental defects, both psychic and physical, as a basis for judicial action.

As to the work of the committee in connexion with the war it is hoped to follow along the lines already taken by the American Committee, who have been instrumental in establishing a mental examination of drafted men into the Americal army. This is being done under the direction of the army medical staff, and up to a short time ago some 15,000 men have been rejected because of mental and nervous disability. The saving to the country through this step will be enormous.

At Verdun Hospital, since the war began we have admitted

forty-eight soldiers, thirty of them returned from active service. Of those admitted five had been patients previously while in civilian life, and had their histories been known, would in all probability not have been taken on the strength. A proportion of the others would have been excluded, had a psychiatric examination been made. The psychoses from which these returned men suffer do not differ essentially from the usual forms; dementia præcox, manic-depressive types, and the toxic forms due to alcohol and syphilis being the more numerous. Eight per cent. of the admissions were general paretics, which would indicate that emotional stress is a factor in accelerating the development of the disease, as most of them average younger than similar cases occurring in civilian life. Sixteen patients have recovered, which is 33 per cent. of the whole.

It is hardly necessary for me to more than touch upon the need for proper study of the inebriate—as truly a mental condition as that of typhoid is a physical disease, while the paupers, prostitutes and sexual perverts are all of different clay from the mentally sound, so far as their nervous entities are concerned.

Gentlemen, I have told you little new, I have merely presented old facts in different garb. If it will cause some of you to give a little more thought and interest to the problems of those caring for the insane and defective, if mayhap your interest in the work of the Canadian Committee for Mental Hygiene has been given a stimulus, I have not wrought badly.

Editorial

THE NEW DIRECTOR-GENERAL OF MEDICAL SERVICES TO THE BRITISH FORCES IN FRANCE

IT is a matter of vital concern to Canadians who should be appointed Director-General of Medical Services to the British Armies in France, since he is ultimately responsible for the care in health and sickness of all troops in the Western field.

Lieutenant-General Sir Arthur T. Sloggett, K.C.B., K.C.M.G., has held the appointment throughout the war, but he has completed his term, and passed the age limit for service on the active list. Accordingly he has gone into honourable retirement in accordance with the general principle that officers so situated shall be replaced by younger officers of proved ability and experience. Under his administration the Medical Service has been beyond reproach and free from criticism.

Lieutenant-General C. H. Burtchaell, C.B., C.M.G., has succeeded to the post, in virtue of his merit as well as of his seniority, From the beginning of the war he has been Assistant-Director, although before that time his promotion was unusually rapid. He is a graduate in arts, medicine, and hygiene of Dublin University, and holds the diploma in State Medicine as well.

The appointment of Lieutenant-General Burtchaell as Director-General of Medical Services in the Field will appeal especially to the Overseas forces, as he was closely associated with them for many years in India and in South Africa, and during the present war in France.

This comradeship with the Canadians was very intimate.

It began at the second battle of Ypres. For the first time the Canadians had gone into action, and in a situation which was strange and difficult, they had the guidance, support, and sympathy of this tried soldier. In the intervening years this mutual confidence and sympathy has increased. Canadians may rest assured that the high standard of medical service available for their sick and wounded will be maintained.

Lieutenant-General Burtchaell has had a remarkable career. He joined the service in 1891. He spent nine years in India, and was present at all the actions in the Tirah campaign, namely, Dargai, Sampagar, Waran, Saran, and Sara. He was promoted Major over one hundred and fifty officers. He served through the South African War on the staff of General Methuen, and was at Belmoont, Gras Pan, Modder River, and Magersfontein. He was then selected as Principal Medical Officer of the South African Constabulary, and after three years' service rejoined the army. After holding various administrative posts in England and Ireland, he went to France in October, 1914, as A.D.G.M.S., was promoted Colonel in March, 1915, and Surgeon-General in October, 1917, with six other officers, passing over seventeen officers of the same rank. General Burtchaell has been mentioned in despatches six times during the present war, and holds many honours and awards. He is well known to all Canadians of the medical service in the field, and his appointment is highly agreeable to them.

THE REËDUCATION OF THE RETURNED DOCTOR

WHAT will be done in this matter after the war? This is one of the problems that the Universities and the Government should be tackling without delay. The latter has declared its intention of returning all men as fit to earn their living as before, so it would not be hard to make out a case for the returned doctor. The vast majority of these

are going to be so rusty on the subjects which constitute such a large portion of their work in peace time, that a post-graduate course will be absolutely necessary, to enable them to compete with their confrères who have remained at home. These considerations apply especially to the Regimental Medical Officers and the Medical Officers of the Field Ambulances who are returned from emergency work of an exacting and absorbing character.

This will be a great opportunity for the medical schools to establish post graduate courses worthy of their reputation for undergraduate work. With the German and Austrian seats of learning unpopular for many years to come, the time is ripe for our schools to strike out boldly in this direction.

There may be a difference of opinion as to how the Government should assist in this matter, and as to the details of the courses, but it would seem to be necessary for a man to have about a six weeks' course for each year of service away from his practice. It should not be difficult for the Universities to handle this work as their teachers are gradually returning from overseas, and many could be available for this work on the completion of hostilities.

It is understood that steps are now being taken in Great Britain and Ireland towards establishing post-graduate courses to meet this situation. Action should be taken in Canada now.

MUNICIPAL HOSPITALS

THE hospital movement in Western Canada, which is epitomized under the term "Municipal Hospitals", has attracted universal attention, and has been a question looming largely before the legislatures of some of the provinces during the past winter. The measures under discussion are entirely a question of responsible control of the administration of public funds for hospital purposes, and the acquisition

of public institutions for which the tax-payer will pay. The question of "Free Hospitals" is an entirely separate one. Apparently there is a misapprehension in the minds of some people at the present moment on this point. Municipal hospitals are not necessarily free hospitals.

The province of Alberta is committed by legislation to a system of public hospitals, built and administered by municipalities or groups of municipalities, but without being committed to a policy of free service to one or any of these institutions. Unanimous sentiment prevails throughout Alberta and Saskatchewan for municipal hospitals built and controlled by groups of municipalities, but on the question of fees there is a division of opinion.

To establish a successful scheme of *free* hospitals demands more than the mere abolition of fees in existing institutions. A number of serious considerations are involved which, if disregarded, would ultimately cause a reaction that would set back the movement throughout the provinces for many years. These considerations are briefly: A definite understanding with the province and outside principalities on the question of accommodation, financing of service to outside cases, a considerable increase of hospital accommodation and reconstruction of some departments of present existing hospitals with a corresponding readjustment of the details of internal administration; a preliminary programme of education of the public as to the use and abuse of such a system. In conclusion, it is imperative that such a scheme should have the sympathy and support of the medical profession.

What is necessary for the final success of free hospital establishment is a gradual readjustment, with careful consideration given to financial as well as social and humanitarian aspects. When once the system has been introduced the establishment should be permanent. The experiment should begin with a few departments, the aim of which should be to reduce the cost of the most expensive service to the people who need it most. Those likely to give benefit to the greatest

number of people and to protect health conditions are suggested as departments in which free service is least likely to be abused. Under this category fall maternity and children's departments. Fees for the use of special equipment—the surgical ward, pathological department, *x*-ray, etc., now press very heavily on a few people. If these fees were dispensed with, it would not impose a greatly increased financial burden on the locality, because the aggregate annual revenue from these sources is so slight. Let it be said then, in a free hospital policy the municipal ownership and control of hospitals is the first necessary step. It is necessary even if the idea of free hospitals be abandoned.

For more than a year the Canadian Red Cross has definitely adopted sphagnum moss for hospital dressing. The McGill University Women's Union established a sphagnum department in a laboratory placed at their disposal by the Medical School in 1916. The use of mosses in surgical dressings dates at least as far back as the Napoleonic wars, but the present extensive use of sphagnum moss has only recently materialized. Professor Porter secured a number of samples of the various quantities of moss from the British authorities and was the first to initiate the work on this side of the Atlantic. He explored the bogs of Eastern Nova Scotia and secured specimens which were accepted as "perfect". The first sphagnum dressings sent overseas were made up by the Junior Red Cross of Guysboro, Nova Scotia. The industry rapidly developed. Since its origin various technical improvements in the preparation of the dressings have been instituted such as the substitution of gauze covering for muslin which interfered with absorbency, and very large orders are being received and filled.

The late Mr. Harry James Smith, of New York, after spending some time with Dr. Porter to familiarize himself

with the technology of the subject, collected large quantities of sphagnum for a plant he organized at his own expense at Arichat, Cape Breton. The American Red Cross, encouraged by Mr. Smith's success, adopted sphagnum and formed a department which they at once placed under his control as organizer and Dr. J. A. Hartwell, of New York, as technical controller.

The Canadian Red Cross is preparing an immense output for the use of their own and the French hospitals. Mr. Smith procured a car of Vancouver Island moss early last winter through Dr. Porter's instrumentality, Mr. Smith generously paying all expenses. The result proved so satisfactory that Mr. Smith went to Seattle in March to organize the industry in the North-western states and to look into the situation in British Columbia. It is known that Mr. Smith met his death by a railway accident occurring on a journey which he took to secure moss for the Canadian Red Cross, and thus crowned a singularly noble life with final sacrifice.

The Medical Week at Hamilton

GENERAL REPORT OF PROCEEDINGS

DURING the week from May 27th to June 1st, a most memorable meeting of Canadian medical men was held in the city of Hamilton, Ontario. Five of the most important associations met together for the first time, and the result more than justified and repaid the expectations and efforts of the local Committee of Arrangements. It was the first of its kind to be held in Canada and judging by its success, we feel that in all probability it will not be the last. It has been our custom in the past to discuss in the JOURNAL the meeting of the "Canadian Medical Association". This year, however, we cannot separate our activities from those of the whole Congress. In the preparations and arrangements for the meeting the officers of our Association did their part as far as they were able at some distance from the seat of activities, but the greater share of the work was done by the local Committee, to whom a proportionate part of the credit is due. The attendance far surpassed all expectations, there being upwards of twelve hundred present. At the present moment it is impossible to say how many of these were members of the Canadian Medical Association, as under the system of registration adopted it will not be possible to sort out the members of the various societies until some time later. As was to be expected, most of those attending came from Ontario. There was, however, a fair representation from Quebec and the Eastern Provinces. The attendance from the West was small, but one could hardly expect it to be otherwise under present conditions.

For the programme itself, we have nothing but praise and the only possible criticism that might be put forward is that there was "too much of it". The first two days were given over to the Public Health Associations, the third day being occupied by the Canadian Association for the Prevention of Tuberculosis. Much of the work, however, of these societies was carried out in combined meetings. Many important subjects were discussed during these first three days, the most notable perhaps being those

dealing with the Venereal Disease question, Child Welfare, and the ever present problem of the management of the tuberculous. All these social difficulties have been accentuated by the war, and were considered in relation to the changed conditions.

On Wednesday evening the President of the Canadian Medical Association, Dr. H. B. Small, of Ottawa, gave his address, which will appear in a later number of the JOURNAL. On this occasion also one of the most important items on the programme was given; we refer to the symposium on the Returned Soldier Problem. This discussion was participated in by some of our best known specialists in this branch of military medicine, and attracted a great deal of favourable comment.

The work of the sections was begun on Thursday morning. It would be quite impossible to discuss, or even to mention, all the interesting and instructive papers given in the various departments. Suffice it to say that each was abundantly supplied with excellent material.

The addresses in medicine and surgery were given by old friends, whom we are always glad to welcome at our meetings. Barker, of Baltimore, and Mayo, of Rochester, are as well known in this country and we may add, as much appreciated, as they are at home. The other addresses were also of a very high standard and were much enjoyed by large audiences. Dr. Barker's address appears in this issue, and we hope to have the others for publication in a later number.

The enjoyment of the meeting was much enhanced by several special features. Moving pictures were shown daily and included many interesting films. The Hart House apparatus attracted a great deal of attention. Perhaps one of the most interesting special features was the Museum Section and the Clinical Laboratory. This was contributed to by the Universities of Toronto, Queen's, McGill, and the Western of London, and the Canadian Army Medical Corps Museum, the whole being under the charge of Dr. Maude E. Abbott, of Montreal. Other interesting exhibits were the *x*-ray section; posters illustrating the propaganda for reform; charts on hospital organization, and posters on the various aspects of tuberculosis.

We have again to comment on the lack of interest shown in the general sessions of the Association. Not more than fifteen members at the outside attended these meetings. With such a large amount of scientific material to dispose of it was difficult to

find time for a business meeting of the Association, but it would appear that more could have attended had they made an effort to do so. The business of the Association should not be left to a mere "baker's dozen", when several hundred are actually in attendance.

We feel certain that the announcement that the next annual meeting will be held in the City of Quebec, will be received with pleasure by all our members. A most enthusiastic invitation was received from the ancient capital, Dr. S. E. Grondin bringing it in person. A very cordial invitation was also received from Halifax, but while this was declined, the hope was expressed that it might be repeated next year when the Association will probably be in a position to give it a more favourable answer. The Executive Committee nominated Dr. S. E. Grondin as President-elect, and this nomination was unanimously confirmed by the general meeting of the Association. We may safely look forward to an enthusiastic meeting under Dr. Grondin's administration.

We cannot close without expressing our opinion that the recent meeting at Hamilton was unquestionably a great success from every standpoint, and was admirably managed from the opening day to the end. We offer our congratulations to the Executive of the Ontario Medical Associstion, to the other Societies participating, and also to the officials of the city of Hamilton who co-öperated and assisted in every way possible.

REPORT OF THE MUSEUM AND LABORATORY SECTION

THE attractive character of this feature of the Congress and the fact that, in the extent and thoroughness of detail to which it was carried, it was something of a new departure in the Association's Programme, makes a special report in place. The section occupied two large well-lighted rooms on the eleventh floor of the Hotel Connaught, where the large series of pathological specimens and microscopic preparations set out in the museum, and the various laboratory procedures demonstrated, were shown to great advantage.

Among the Museum series, the greatest interest was undoubtedly elicited by the specimens from the C.A.M.C. museum, shown by special permission of Surgeon-General Fotheringham, and under the personal charge of Capt. A. B. Chandler, C.A.M.C. Keen enthusiasm in the examination and study of these, the first war specimens to reach Canada, was displayed not only by the many military surgeons and civilian practitioners who visited the exhibition, but also by a continuous procession of the general public. The exhibit consisted of some thirty-five specimens, showing different types of wounds caused by modern warfare, collected at the Casualty Clearing Stations and Base Hospitals in France, and sent forward to Canada with a number of others from the Imperial collections housed at the Royal College of Surgeons in London, as the first instalment for a Canadian War Museum. In the series the specimens of intestines showing multiple wounds of entry and exit produced by a single bullet traversing successive coils, and brains showing impact from the opposite side of the cranium were especially noteworthy. From the point of view of surgical interference the intestinal wounds were also most interesting, for military statistics in the present war show that even such wounds under modern surgical treatment, when this can be applied early, have a very low mortality, while in previous wars they were nearly always fatal. The value of a Canadian War Museum to the country at large and to the Army Medical Corps in particular, and the wisdom of the military authorities in initiating this, was universally felt and warm appreciation was expressed on all sides.

The University of Toronto set out a very fine collection of interesting conditions, beautifully mounted under watch-glasses. The special feature of the Western University of London exhibit was the interest of the individual specimens and the carefully detailed history sheet attached to each. From McGill University came three excellent special exhibits, one on animal parasites, one on congenital cardiac disease, and one on diseases of infancy.

In the Clinical Laboratory part of the Section the various demonstrations were set out with elaborately labelled steps of procedure, and a series of highly instructive demonstrations were kept up. Abstracts of some of these have been received, and are subjoined.

1. Dr. A. H. Caulfeild, of the Connaught Laboratory of Toronto, showed experimental prevention and treatment of gas gan-

grene, similar to that produced in man, in pigeons by inoculating with the B. ærogenes, before, during, and after protective doses of antitoxin. The results were striking. An antitoxin for gas gangrene is now a proved fact.

2. Dr. Norman Beal, of London, demonstrated on transfusion, first touching upon the history of this subject and the modern revival of interest in it following Carrel, and discussed the disadvantages of the early methods of Crile and Elsbey in which artery to vein transfusion was done, and which has been abandoned, because it is technically difficult, destroys the artery, and does not enable an accurate estimate of the amount of blood transfused to be made. The use of Hirudin had also been abandoned. Sodium citrate, another anticlotting method, was of use in some cases. The methods of passing the blood from the donor's to the patient's vein without adding any chemical are those recommended to-day. Three of these methods were discussed:

(*a*) Syringe method—Lindeman's needles, not generally used now. Still useful in children. Consists in passing blood into the superior longitudinal sinus at posterior part of anterior fontanelle.

(*b*) Percy's method—Tube and illustration shown.

(*c*) Unger's method.—Demonstrated.

3. Drs. Luney, Campbell, and Crawford, of the Institute of Public Health, London, Ontario, presented a continuous demonstration of routine laboratory procedures in Board of Health diagnosis throughout the entire week.

The demonstrations consisted mainly of the bacteriology of tuberculosis, typhoid fever, and diphtheria. Under the section of tuberculosis, besides smears of sputum containing B. tuberculosis, there was on demonstration pure cultures of B. tuberculosis obtained directly from sputum following closely the technique of Petroff. A mounted guinea-pig, which had five weeks previously been inoculated with a positive sputum, showed extensive tuberculous infiltration; at the site of inoculation a characteristic tuberculous ulcer was early found with later involvement of the inguinal and lumbar glands, liver, spleen, lungs, and axillary glands.

The section under typhoid not only demonstrated the agglutination test of Widal, and Gram stained preparations of the organism, but also aimed to show the close morphological resemblances of the colon-typhoid group of organisms and their differentiation by cultural methods, using as media for differentiating, litmus,

dextrose agar, litmus lactose agar, litmus saccharose agar, indol broth, and litmus milk.

The section on diphtheria illustrated microscopically the various types of B. Diphtheriæ as classified by Wesbrook. Smears prepared directly from the throat of diphtheritic patients stained by Kenyoun's stain were also demonstrated. Numerous other microscopic preparations including micrococcus meningitidis, micrococcus gonorrhœa, B. influenzæ, the spirillum and fusiform bacillus of Vincent's angina, treponema pallida, diplococcus pneumoniæ, streptococcus hæmolyticus, and others, were demonstrated.

4. Dr. H. K. Detweiler, of the University of Toronto, showed diagnostic features in syphilis as follows:

(*a*) The Wassermann test for syphilis, showing typical, very strongly positive cases, negative cases, and serums from patients showing the effect of treatment. (*b*) The Lange colloidal gold reaction for spinal fluid showing typical paretic and luetic curves. (*c*) The Spirochæta Pallida, by Levaditi in the india-ink method. (*d*) Wall charts giving summary of the results of Wassermann tests in the wards of the Toronto General Hospital, the out-patient department, and those done in the laboratory of the Provincial Board of Health. (*e*) The technic of the dark field illumination for spirochætes.

5. Dr. W. L. Robinson of the University of Toronto demonstrated methods of preparing sections for rapid diagnosis at the time of operation, using a new mounting fluid which greatly improves the result of the staining by polychrome methylene blue.

6. Dr. Davis, of the Municipal Health Laboratories, Toronto, showed an exhibit illustrating:

(*a*) The microscopic appearances of bacteria producing contagious diseases.

(*b*) Outfits supplied free to physicians through seventy-five culture stations scattered throughout the city, diphtheria swabs and culture media, bottles for tuberculous sputum, slides for smears from gonorrhœa and blood smears for Widal, and outfits for blood collection for Wassermann's.

(*c*) Diphtheria and tetanus antitoxins, anti-meningitis serum, typhoid, para-typhoid, smallpox and whooping-cough vaccines, distributed free.

(*d*) Milk examination for bacteria by culture plates; estimation of butter fat by Babcock's test; specific gravity by lactometer; by the dirt test, and tests for preservatives.

7. A continuous demonstration was conducted by Drs. Paul Roth, of Battle Creek, and Maude E. Abbott, of Montreal, on methods of air analysis with especial reference to the determination of the CO_2 tension. The following account is received from Dr. Roth:

"Air analysis as an aid to clinical diagnosis is attracting more and more the attention of the clinician.

The determination of alveolar CO_2 tension by means of the older classical methods is still the most satisfactory one and is comparatively easy.

The demonstrations included the following:

(*a*) Methods of collecting alveolar air for analysis: the Plesch-Higgins' method, Haldane's method, and Roth's method.

(*b*) Methods of analysis of the sample by means of Haldane's and Henderson's apparatus.

(*c*) Marriott's simple yet sufficiently accurate method for the use of the clinician who is limited to the simplest facilities.

(*d*) A simple method of detecting more or less quantitatively acetone in expired air by means of the Scott-Wilson solution.

(*e*) The causes, significance and treatment of acidosis were summed up in several charts.

Proper equilibrium in the alkalinity of the blood and other body fluids is as essential to normal metabolism as is the regulation of body temperature. The thermometer is the index of the latter while the alveolar CO_2 tension is generally (though not invariably) an index of the first. In either case the detection of departure from the normal is obviously of great clinical importance."

Resolutions

Amongst the important resolutions passed at the meeting the following may be noted:

Moved by Dr. H. B. Small, Ottawa, seconded by Dr. John P. Morton, Hamilton, and unanimously carried,

That whereas the members of the Canadian Medical Association have viewed with admiration the collection of specimens from the C.A.M.C. Museum, which were sent to Hamilton by special permission of Surgeon-General Fotheringham for the Canadian Medical Week, and whereas these war specimens have aroused great interest both among military surgeons, civilian practitioners, and the general public visiting the Con-

gress, and since their further collection and their adequate preservation and development into a great Canadian War Museum must be of the utmost value in the education of the Canadian Army Medical Corps at the present time, as well as a fitting memorial to future generations of the sacrifices of our troops, be it resolved,

That a copy of this statement of appreciation be sent to Surgeon-General Fotheringham, D.G.M.S., with the recommendation that it be forwarded to the Minister Overseas as an expression of the warm support which the development of a Canadian Army Medical Corps Museum received from the members of the Canadian Medical Association.

Having been moved and seconded it was unamiously resolved:

That having heard the address of officers of the Aviation Service of the United States Army upon the great necessity of a proper physical training for cadets after entering the Canadian Air Force and the necessity for medical supervision of aviators during their full time of active service, we would urge the Imperial Government and the Government of Canada that in order that many lives may be saved from avoidable causes, that specially qualified Medical officers be appointed to the Aviation Corps.

Dr. C. E. Green, of Edinburgh, in a recent work on the cancer problem, advances the view that cancer is most likely to occur in localities where the fuel contains a high proportion of sulphur. In his investigations, especially in certain districts in Scotland, he has found that the cancerous districts are those burning coal, and those where cancer is infrequent burn wood or peat. In Nairnshire, where Scottish cancer mortality reaches the maximum, the disease is very definitely confined to half the county or less, while the remaining area of about one hundred square miles is entirely free. In the cancer free section, peat is exclusively used, and in the cancerous portion coal is the chief or only fuel. In the Orkneys, peat burning Stenness counts only one cancer victim in forty-two deaths from all causes, while one-ninth of all deaths in coal burning Sanday are due to this disease. Birsay in the Orkneys and St. Andrews furnish an apparent exception to the rule, as these places burn peat, yet have a high cancer mortality. The explanation is that the peculiarly hard stony soil produces peat with an unusually large proportion of sulphur.

Obituary

DR. HUGH CAMERON

A PROMINENT citizen of Nova Scotia has just passed away in the person of Dr. Hugh Cameron, former M.P. for Inverness, which he represented in the House of Commons for twenty years.

Dr. Cameron was born at South River, Antigonish County, in 1836. He was educated at St. Andrew's Grammar School and at St. Francis Xavier College, of which he was one of the earlier professors. He graduated with honours in 1861 at the University of Pennsylvania, and for a time practised his profession successfully in that State, and served as an army surgeon in the American Civil War. The insistent call from his home country to return and take up practice in Eastern Nova Scotia was a deciding factor in his life. Few men have had a more strenuous career. He came to Mabou, Inverness County, and had for his field of action that vast territory extending north from the strait of Canso one hundred and thirty miles to Bay St. Lawrence, and from Mabou to Baddeck a distance of over forty miles. It now takes about twenty capable doctors to care for the needs of this territory then attended to by Dr. Cameron alone. He laboured under the greatest difficulties, with no hospitals or trained nurses to assist him, and for fifty-four years gave freely of his time and skill in overflowing measure to alleviate the sufferings of rich and poor alike.

Dr. Cameron enjoyed the unique distinction of having been the youngest member of the first Canadian Parliament, and since the death of his old leader, Sir Mackenzie Bowell, he is the last of that notable group of men who sat at Ottawa immediately after Confederation. He enjoyed the confidence of Sir John A. Macdonald to a very marked degree.

When Dr. Cameron retired from practice and the active cares of life, he carried with him the good wishes of a continent-wide circle of friends. He was noted for his toleration and broad sympathies, for his loyalty to friend and his fairness to foe, and above all for his Christian fortitude and sterling integrity. His death, in his eighty-second year, removes from our midst a noble hearted

doctor with a stainless professional record and a venerable and distinguished citizen who has served his country long and honourably.

Dr. M. H. Haight died suddenly at his home in Toronto from heart failure at the age of forty-nine. He took his medical degree at McGill University in 1893. He then settled in New Durham, his birthplace, and practised there for fourteen years. After taking a post-grauate course abroad he went to Toronto where he resided at the time of his death.

Dr. Boyle Travers, the oldest physician in the Province of New Brunswick, passed away, April 7th, at his home in St. John, at the advanced age of ninety-four. He was born in Ireland in 1824, educated at Trinity College, Dublin, and took his degree in 1847. The following year he came to Canada and for seventy years resided in St. John, during that long period never changing his place of residence. In the cholera epidemic in 1854 Dr. Travers did splendid service in caring for the sick and dying during that awful visitation. Dr. Travers took a keen interest in all matters pertaining to the city of his adoption, and, though never seeking political honours, always took his share in any cause that had for its object the betterment of social or political conditions. He enjoyed the full confidence of the people he served so faithfully and when he retired from active work left a vacancy hard to fill.

Dr. Travers was a member of the Senate of the University of New Brunswick, for many years a member of St. John School Board, and the first president of St. Patrick's Society. In 1864 he married Catherine Sweeney, sister of the late Bishop Sweeney, and is survived by five children and seven grandchildren. His two sons adopted their father's profession one being Dr. J. Boyle of the Provincial Hospital Staff and Dr. H. P. Travers, St. John.

Dr. Patrick Robertson died at his residence in Caversham, England, on April 9th. Dr. Robertson was the eldest son of Dr. William Robertson of Edinburgh, Scotland, and was born in St. Andrews, Argenteuil County, where, after graduating in medicine at McGill University, he succeeded to his father's practice. In 1896 Dr. Robertson left Canada for England with a view to taking up special branches of his profession and finally went to Oxfordshire, where he resided till his death.

Dr. N. D. Richards died in Belleville, on April 18th, after suffering some time from heart trouble. He was born at Cramhae, Northumberland County, in 1852. He graduated in 1877 from Toronto University with honours, and was a silver medalist. After practising thrity-four years in Warkworth he removed to Belleville, where he spent the remainder of his life.

Dr. Newton, of Deseronto, died February 13th, aged seventy-six. He graduated from Queen's University in 1866. He commenced practice in Deseronto in 1870, remaining there until the time of his death. He was for many years physician to the Mohawk Indians on the reserve. He was Mayor of Deseronto in 1903–4, and again occupied that office till 1907–12. He took an active interest in politics, and was for some time president of the Conservative Association.

Dr. William P. McNally died after a brief illness in Bangor, Maine. He was born in Prince Edward Island. He received his medical education and graduated from McGill University.

Dr. L. G. McKibbon died March 3rd, in Toronto, after suffering from paralysis for four days following a stroke a month previously. He was fifty-two years of age. He graduated M.D. from Trinity in 1886. He practised for two years in Blackstock and then removed to Toronto where he continued to practise his profession until the time of his death.

Miscellany

News

ALBERTA

The venereal diseases prevention act stands for its first reading in the Legislature. It provides that every hospital receiving aid from the province shall have accommodation for persons suffering from such disease. None but qualified medical practitioners shall attend upon, prescribe, offer or supply drugs or appliances for treatment; publication, issuing or distribution of particulars with

regard to drugs or appliances is forbidden under a penalty of not less than $100, and not more than $1,000, defaulting penalty not to exceed twelve months. In addition, there is a fine of $200 or three months for in any way intimating that a person has contracted the disease or been examined. Secrecy on the part of every person employed in the administration of the Act will be enforced not only by the imposition of the penalty, but by dismissal from office.

Among the financial provisions for the coming year, with regard to the 1918 estimates, appropriations of $218,000 for hospitals and public health purposes were features of the action recently taken by the legislature. This amount included votes passed for the care of incurables $9,000; medical care of soldiers' children $15,000. The proposal is under consideration for a tubercular sanatarium, to be built jointly by the Dominion and Alberta governments, the cost of which is estimated at $400,000.

BRITISH COLUMBIA

Dr. Ernest Hall has made a most generous offer to supply the Royal Jubilee Hospital, without charge, with his own electrical equipment, including galvanic, faradic and electro-therapeutic appliances, provided that space were found for its installation. The donor further undertook to supply the services of a qualified medical electrical expert for half a day per week, free, for the treatment of returned soldiers.

MEDICAL COLLEGES

Colonel H. S. Birkett, C.B., Dean of the Faculty of McGill University, and professor of oto-laryngology, in the University, has been honoured by being elected unanimously as President of the American Laryngological, Rhinological and Otological Society at its recent meeting held in Atlantic City on May 25th. This is the first occasion that a Canadian has received this distinguished honour and which is doubtless in some part in recognition of his services in the great war. Colonel Birkett is to be congratulated on this well-deserved honour.

In the results of the first year in medicine at McGill University to which women students have just been admitted, the lists are headed for the first time by a woman, Miss Jessie Boyd, B.A. Two of the four women enrolled have secured aggregate honours

in all subjects, and the other stands thirteenth on a pass list of seventy-two students.

Toronto University

The University of Toronto, Faculty of Medicine, held a special convocation, April 25th, to present their degrees to the students who have successfully passed their fifth year examinations. There were seventy-five students on the list, twelve of whom had already been on active service, and many others are preparing for overseas duty. Lieut.-Col. E. S. Ryerson, Assistand Director of Medical Services in the Toronto military district, after the ceremony interviewed the graduates eligible for service under the Military Service Act. About fifty of the graduates are competent, but at present only thirty are required in the Army Medical Corps in this district. Those selected by Colonel Ryerson will be ordered to report at the Army Medical Training Depot. The president, Sir Robert Falconer, concluded his address to the students with these impressive words: "The State will expect a fuller service from those on whom it has conferred special advantages. You are sent out competent for the work of the immediate future, and when you return you will be expected to carry on a work of a higher grade."

Among the medical staff in khaki on the platform were Lieut.-Col. Stanley Ryerson, Lieutenant G. Wishart and Colonel Primrose, who has recently returned from the front, and who made the presentations. Five women were among those who received medical degrees.

Queen's University.

Queen's Medical Faculty are making satisfactory arrangements with regard to the new military service regulations. Men, liable under the new regulations of the Act, will be placed in the C.A.M.C. for medical work in Canada. If conditions warrant, they will be allowed to continue their studies in the fall. A summer session is likely to be held to graduate fourth year men in the late fall so that they may take overseas commissions.

McGill University

On April 16th, McGill University held its annual convocation for conferring degrees in medicine. Sixty-two men received the degree of M.D., C.M., and of this number practically every man volunteered for military service. The prize winners were: Holmes

Gold Medal, R. H. MacLauchlan; Final Prize, R. R. Struthers, B.A.; Wood Medal, H. E. Skeete. The advancement of the date of convocation was the result of the request of the military authorities for the earlier graduation of the final year in order that they might make use of their services.

ARMY MEDICAL SERVICES

Sir Edward Scott Worthington has been created a Knight Commander of the Royal Victorian Order. He served with distinction in the South African war from 1899 to 1902, was appointed physician to the Duke of Connaught when Governor-General of Canada, and went to the front in 1914.

Colonel Alexander Primrose, C.B., professor of surgery of the University of Toronto has been made a Companion of the Order of the Bath. He went overseas with the University Hospital, and served in Greece and England, where he was consultant to the Canadian forces.

Victor Odlum, James Elmsley and Colonel Arthur Edward Ross have been created Companions of the Bath in the King's Birthday List of Honours.

Dr. C. E. Edgett, Canadian North West, and Major Theodore A. Lomer, medical health officer of Ottawa, have received the Distinguished Service Order from the King.

Major Charles Woolward, C.A.M.C., has been appointed to take charge of the Vancouver military hospital, in succession to Colonel C. E. Doherty, who has resigned.

Major A. D. Macdonald, of Victoria, has been appointed deputy commandant and assistant director for British Columbia of the invalid soldiers' commission, with headquarters at Vancouver.

Lieutenant-Colonel J. A. Hutchison has been appointed consulting surgeon of the Canadian Army Medical Corps. He succeeds Colonel George Armstrong, who recently returned to Montreal. Lieutentant-Colonel Hutchison was the chief medical officer of the Grand Trunk Railway, senior surgeon of the Montreal General Hospital, and professor of surgery at McGill University. He went overseas in the latter part of 1916. He was acting commanding officer and chief surgeon of No. 1 Canadian General Hospital at Etaples, France.

Major J. S. Matheson, senior medical officer at the Canadian Clearing Station at Buxton, England, has been transferred to No. 3 Canadian Hospital at Etaples.

Sir Edward Kemp, after inspecting the Canadian Army Dental Corps, declared that to Canada was due the development in army dentistry, and that in this direction all other allied nations have followed in her lead. Both the Australian and New Zealand contingents are sending men to the Canadian Dental hospitals to take a course in the treatment of "trench mouth", which is one of the greatest sources of infectious trouble at the front, spread by the use of the same drinking utensils. Colonel Armstrong, of Ottawa, and his staff, have already performed nearly two million dental operations, including French peasants as well as soldiers, since the unit was organized in 1915. Jaw treatment is another specialization of the Canadian Dental Service. After injuries received on the battlefield, these cases are drafted to the Ontario Hospital at Orpington, Kent, where a highly skilled staff of operators are producing remarkable results.

The Petawawa Camp has been placed under the medical control of Colonel Fraser, of Ottawa, who has been appointed A.D.M.S. of the camp. Nursing Sister G. B. McCullough, Royal Red Cross, will leave Kingston with a party of five nurses to make up the nursing staff of the camp. One or two medical officers will be sent from Kingston.

Two large Canadian hospitals suffered heavily in the recent German raid on British hospitals in France. One monster bomb fell direct on the sleeping quarters of the Canadian orderlies and other personnel and many were blown to pieces. The Canadian nurses shared the honours with their British sisters. They showed the utmost heroism in tending the wounded under a terrific fire from the skies. When Matron Number Seven called for volunteers to move across the open, under bomb, fire in order to give needed help every nurse present immediately volunteered. She took the nearest two who moved out unhesitatingly as though selected for a special honour. Many nurses were wounded and some killed. The latter, two days later, were given a soldier's funeral. Special recognition is due to the orderlies, who suffered heavily, many of whom were elderly men. They were doing splendid service, and their faithfulness and excellence had aroused general respect.

The University of Toronto has conferred the Degree of Doctor of Public Health upon Lieutenant-Colonel George Nasmith,

director of the civic laboratories. Dr. Nasmith has just returned from France where he has been engaged on army sanitation work, on which he has written a valuable book. He is now entitled to the letters C.M.G., M.A., Ph.D., D.Sc. (honorary degree conferred a year ago) and D.P.H.. He graduated from Toronto University in 1900.

The Cross of the Legion of Honour has been awarded by the President of the French Republic to Colonel Noel Marshall, of Toronto, chairman of the executive committee of the Canadian Red Cross Society. The honour was conferred in recognition of services rendered to France.

Colonel Dr. C. A. Hodgetts, Canadian Red Cross Commissioner Overseas, has tendered his resignation which has been accepted. Lady Drummond has assumed the position of assistant commissioner of the Canadian Red Cross Society in England. Her multifarious and beneficent activities on behalf of the Canadian wounded since the outbreak of the war have been warmly commended by Colonel Hodgetts. The latter was presented with several pieces of silver from the members of the staff in grateful acknowledgement of his services. In the 1917 birthday honour list, the King conferred the decoration of C.M.G. in appreciation of his work.

Casualties

Killed in Air Raid

Captain D. E. Howes, C.A.M.C., Ontario

Died of Wounds

Dr. E. E. Meek, C.A.M.C., Regina
Horace McMillan, C.A.M.C., Nova Scotia

Died on Active Service

Nursing Sister Forneri, Belleville, Ontario

Wounded

Captain Henry Clinton Pearson, C.A.M.C., Toronto
H. Tozer, C.A.M.C., London, Ontario
E. M. Osborne, C.A.M.C., London, Ontario

Book Reviews

BLOOD TRANSFUSION, HÆMORRHAGE AND THE ANÆMIAS. By BERTRAM M. BERNHEIM, A.B., M.D., F.A.C.G., instructor in clinical surgery, the Johns Hopkins University. 247 pages. Price $4.00. Publishers: J. B. Lippincott Company, Philadelphia, London and Montreal, 1917.

BERNHEIM'S name has been for the past seven or eight years closely associated with blood vessel surgery and blood transfusion. At the Johns Hopkins Hospital and in Baltimore generally he has had the opportunity of a large experience, particularly in blood transfusion; and the present work is valuable not only for its full consideration of the large amount of work done in this field, but also for the critical judgement based on experience which the author is able to contribute. The book is thoroughly up to date, its publication dating from May, 1917. It is a volume of 247 pages and is written in a pleasant style which makes very easy reading. The table of contents includes twelve chapters as follows: Blood and the Phenomenon of Bleeding; Diagnosis of Hæmorrhage; Control of Hæmorrhage—Factors Involved in a Determination of Danger Limits. Blood Pressure; Indications for Transfusion; Danger of Transfusion—Hæmolysis and Agglutination; Selection of Donor for Transfusion—Dangers to Donor—Treatment of Donor after Transfusion; Methods of Transfusion—Technique; Transfusion for Acute Hæmorrhage and Shock—Accidental Gastric Ulcer—Post-operative—Post-partum—Placenta Prævia—Extra-uterine Pregnancy—Typhoid Fever; Transfusion for Anæmia and Debilitated Conditions in General—Blood Dosage; Primary Pernicious Anæmia; Transfusion for Hæmophilia, Melæna, Purpura, Neonatorum, Jaundice; Leukæmia—Splenic Anæmia (Banti's Disease)—Certain Toxæmias.

It is the opinion of the reviewer that Bernheim's book is the best one published to date on this subject, particularly for the general practitioner and the junior members of hospital staffs, who, from the necessity of the case, are most often entrusted with the carrying out of transfusion in emergencies. In other words, the book is to a large extent most practical. The technique of transfusion in its various forms is very fully described. The author is

inclined to favour on the whole the citrate method, and in this the reviewer feels that he is right. Although relatively considerable space is given to a description of the older direct methods of transfusion, it is acknowledged that these are now practically obsolete. Most hospitals now possess apparatuses devised for the indirect method, whether the Kimpton-Brown glass cylinder, the syringe outfit of Lindeman, the apparatus of Unger, or of Bernheim, or others less well known. But all these need somewhat more training and expertness, and are more liable to get out of order than a simple syringe or funnel outfit with cannula, which is all that is necessary with citrated blood, which can be treated practically as if it were so much saline.

There are valuable chapters upon the selection of the donor, and upon the danger of transfusion. Moss' well-known work on blood groups is given in extenso, together with several other methods of testing the donor's against the patient's blood. Bernheim, however, believes strongly that in cases of great emergency there is less danger in doing an immediate transfusion than in waiting to work out the question of compatibility between donor and patient.

The table of contents indicates the scope of the other chapters, a consideration of which is hardly allowed in the space of a book review. Suffice it to say that in each chapter the subject is brought well up-to-date.

Medical Societies

No. 1 CANADIAN GENERAL HOSPITAL CLINICAL SOCIETY

Meeting January 3rd, 1918

Present the following officers: Colonel Simpson, president; Lieut.-Col. Gunn, Majors Gwyn and Harrison; Captains MacDermot, Baragar, Beech, Connolly, Forsyth, Fraser, Kenny, Lauchland, Logie, Mackay, McMurrich, Moffatt, More, Wade; three visitors.

Specimens from Autopsy. Presented by Captain Baragar.

1. A larynx and trachea showing a large amount of yellowish white membrane, desquamating in places, and extending from the tip of the epiglottis to the bifurcation of the trachea. Underneath, the mucuos membrane is seen to be rather deeply injected. The membrane is only fairly adherent.

The specimen is from a surgical case. The patient complained of his throat for several days before death by sepsis. Strangely enough a culture from the wound a few days before death showed an organism resembling bacillus diphtheriæ, attained by Neisser method, though a culture from the membrane itself was negative for this organism, and showed only streptococci and staphylococci.

2. Liver from a case with the following history. Patient wounded on November 27th and died on December 28th. There were severe infected wounds, and left leg was amputated. At post mortem a septic infarct was found at the base of the left lung, and the lung was covered with exudate. It is well seen in the specimen shown. In the epigastrium was found a very small healed wound, which never had caused trouble. This was found to pass through the insertion of the left rectus muscle and enter the liver. The wound in the liver was well closed by organized exudate, but on stripping this off, pus welled out, and a septic track about six inches long was found in the right lobe. It contained about one ounce of pus and a small metallic F. B. was lodged at the end of the track. This was all very well shown in the specimen.

Eye Case. Type of Iritis. Demonstrated by Captain Fraser.

Captain Fraser stated that the case was particularly interesting because it was so characteristic. There was a history of the man having had gonorrhœa sixteen years ago, and he has had six relapses since. He now has slight pale discharges in the morning. His present attack of eye trouble began about three weeks ago. The eye became very red, and it has gradually increased in severity to its present condition. The man had rheumatism while at the front, and a year ago fell on his knee, which swelled up in consequence. He was sent to hospital, and remained there some weeks. He now has occasional attacks of synovitis. Colonel Simpson spoke briefly, and asked what features were present which had resulted in the case being determined as one of gonorrhœal iritis; and if there was any difference between the iritis seen in this case and that of a rheumatic condition.

Captain Fraser in reply stated that while in London he had been brought into contact with a series of such cases, and his experience left no doubt as to the character of the present case. It had been found that an exudate in the anterior chamber, like the case before us, is not common. Paracentesis had determined the presence of fluid. seventy per cent. of the cases had gonorrhœa. In no case in which there was exudate in the anterior chamber were

we unable to demonstrate gonococcus or gonorrhœal history. There was no exudate in tuberculosis, and usually nodules could be seen at the periphery of the iris. There was also likely to be come corneal affection.

In reply to a question by Colonel Gunn as to treatment, Captain Fraser stated that if the patient does as well as expected, there will be a great change in a week's time. The exudate will disappear. Atropine was being given now in large doses.

Case of Skin Disease. Lupus? Demonstrated by Captain Kenny.

Captain Kenny drew attention to the violet coloured groundwork, with masses in various parts. These are nodular and characteristic. The history of the case dates back to 1902, and has been continuous since that time. There is a doubt as to whether it is a case of lupus. The report of the skin removed from the case would be given at the next meeting.

Captain Kenny instanced an interesting case which had passed through No. 24 General Hospital. Excision had been made at the C. C. S., and there was growth when the patient was admitted. He also had periostitis. Excised portions from periosteum and from scalp resulted in report from pathologist that it was tuberculous.

Major Gwyn discussed the case.

Captain Moffat asked what the nature of the discharge was, and if actinomycosis had been found. The nodules and the length of time in which it had been going on prompted this question.

Case of Malignant Disease of Stomach or Small Intestine. Demonstrated by Captain Baragar.

Captain Baragar gave an outline of the history of this case. Patient was admitted on December 23rd, 1917. He had been attached to the anti-aircraft section. On admission he complained of weakness, pain in the back, in the neck, and across the shoulders; loss of weight. Note made at the C. C. S. to the same effect. He had entered the latter in a collapsed condition, and required immediate treatment. The first trouble noticed was eight years ago, when pain developed; after that, vomiting, which came on at intervals of about a month. The attacks gradually increased, but the patient felt fairly well in between times. The vomiting usually occurred after meals, The next symptom was loss of appetite, and for the last year this has continued. He had has a tendency to constipation; has passed blood by the bowel, and after a dose of salts it was quite red. Notes made at C. C. S. said that the same

colour was in the vomit. When he came into the hospital, the first thing noticed was the paleness of skin and mucous-membrane, great weakness and loss of flesh. Lungs were negative. Heart showed slight murmur at the apex. A test breakfast was given, and the stomach pumped about one and a half hours later. It seemed normal except for some mucous, and contained .35 per cent. of hydrochloric acid. A second breakfast given and stomach pumped about three-quarters of an hour later, showed a small amount of mucous. Yesterday morning the stomach was inflated. The position as shown is normal, and well up in the epigastrium. Dilatation caused no particular discomfort. The stomach was washed out, and almost a quart of water put in. Urine was negative; stool reacted strongly for blood. Blood examination showed: Hæmoglobin, 20 per cent.; R. B. C., 1,550,000; W. B. C., 7,600. Not very much change in the differential. Another blood count showed a slight increase in the number of reds. Hæmoglobin about 25 per cent. Patient is now feeling very well.

Major Gwyn in discussing the case said, that it was one that presented some distinctly unusual features. The most striking thing was the man's extreme degree of anæmia, and it is undoubtedly a secondary anæmia of very marked degree. The history of the case is very suggestive of cancer or a chronic ulcer. The absence of pain or presence of hydrocholric acid should not influence one in arriving at diagnosis. At one time since the patient's stay here, he had a very distinct mass which could be felt. The disappearance of the mass is the commonest possible feature in gastric-neoplasms. He had very little doubt that there is a mass of some sort situated in the stomach, but the point is whether that is a carcinoma or whether it is a mass of scar tissue lying in the stomach wall. It is not an uncommon thing in the old scarring ulcer cases to have a very distinctly palpable mass; a mass which might give all the suggestions of carcinoma. Nothing was found in the examination of the glands. The glandular condition is always interesting, and no case of neoplasm of the stomach or abdomen had been completely examined unless the supraclavicular glands had been looked into.

Case of Chronic Pneumonia following Lobar-Pneumonia. Demonstrated by Captain Baragar.

The patient was admitted on December 10th, complaining of pain in the right side of chest, shortness of breath, weakness, some cough, and slight expectoration.

The onset had been on November 23rd or 24th, with shortness of breath and pain in the side. The C. C. S. notes on November 27th report a dry friction on the right side, solid lung around the right nipple, tubular breathing over right lung, and later the whole lung became solid. The patient ran a continuous temperature to 102° and 103° until the 30th. This subsided by lysis, reaching normal in about eight days' time. He had had an attack of pleurisy when nine years of age, and an attack of jaundice some years ago, but had otherwise been fairly healthy. On admission to this hospital he was visibly dyspnœic, weak, and somewhat emaciated. On examination, the right side of his chest was found to be much shrunken, and showed marked diminution of expansion, and impairment of resonance, the note being almost flat posteriorly, at the apex in front, and in the axilla. The area from midway between the nipple and the anterior axillary fold to the sternum, and the base in front is more resonant, but the vocal fremitus is increased over that side. On auscultation, the normal vesicular murmur was almost absent throughout. There is amphoric breathing at the apex of the axilla. At the base there were a few crepitations, and also in the axilla. The left lung showed some loss of resonance at the apex, and a few crepitations. The apex beat is little, if at all, displaced. The blood count is not far from normal. White blood cells, 9,800; red blood cells, 4,800,000; hæmoglobin, 80 per cent. The differential count shows a slight rise in the lymphocytes, 41 per cent. The urine shows a trace of albumen. The *x*-ray is very interesting, bearing out the clinical findings very well, showing, as it does, a narrowing of the chest on the right side, a high diaphragm, and a markedly increased density of the right lung, especially at the apex and the outer half. Weakness is now rapidly decreasing, and the symptoms have practically cleared up.

Captain Moffat, in discussing the case, said that the history as given suggested rather forcibly one of two things; either that the case was one of delayed resolution, or there has been osme previous tubercular trouble. Lacking further history, there seems to be delayed resolution of pneumonia. Such cases are quite common. The chart is rather suggestive, it having taken ten days to reach normal. The *x*-ray picture on the other hand rather points to the fact of some previous lung trouble, as also would the fact that there is a collapse; that there is still considerable consolidation towards the wall; and that the man is evidently below par.

Major Gwyn discussed the points brought out by Captain Moffat. The most striking feature of the man as first seen, was the apparently rapid contraction of the chest.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

The seventh regular meeting of the society was held Friday, January 4th, 1918, Dr. A. E. Garrow, president, in the chair.

Pathological Specimen: Heart showing atresia and occlusion of the aorta at the site of the ductus botalli in a man thirty-five years of age, by Dr. W. S. Scott.

Demonstration: Dr. M. Lauterman demonstrated a new urethroscope and an improved apparatus for the administration of the Carrel-Dakin solution in the treatment of wounds.

Address: Major C. K. Russel addressed the meeting on Psycho-genetic conditions in soldiers, giving a resumé of the work of different hospitals both in England and France where these cases are being treated; the various methods of treatment; the men who are doing special work along these lines; his own work and researches and the splendid results obtained for the men.

Dr. C. F. Martin and Dr. M. Lauterman took part in the discussion and Major Russel replied.

The eighth meeting was held January 18th, Dr. A. E. Garrow, president, in the chair.

Living Case: Dr. L. T. W. Penny exhibited a case for Dr. J. Appleton Nutter, illustrating the end result of the operative treatment of obstetrical paralysis. (To be published later.)

Papers: 1 An experience through the Halifax disaster, with illustrations, by Dr. F. T. Tooke. (Published in the April number of the Journal.)

2. Recent conceptions of immunity and their practical bearing, by Dr. H. Oertel. (Published in the April number of the Journal.)

The ninth meeting of the society was held in the Royal Victoria Hospital on February 1st, 1918, the members of the society being the guests of the hospital.

An interesting demonstration of medical and surgical living cases was given in one of the main medical wards of the hospital by the members of the staff; and exhibits of pathological specimens and of clinical apparatus were also shown. Following this, Professor W. T. Porter, of Harvard University, gave an address on surgical shock with special reference to observations made in the base hospitals in France, which was of great interest.

The following cases and exhibits were presented in Ward "A".

Surgical: Dr. Garrow: Living Cases—Two cases of fracture

of the neck of the femur; hæmangioma (extensive) of the left arm; cases of jejunostomy; case of paraplegia with remarkable history; latent spina bifida (?); large mucoid fibroid of abdominal wall; subcostal incision in gall-bladder surgery; cancrum oris following measles; cartilage chips in filling bone defects (with actinograms); typhoid hip-joint.

Dr. Archibald: Three cases of carcinoma of splenic flexure; case of traumatic asphyxia.

Drs. Keenan and McKenty: Living cases.

Dr. W. J. Paterson: Cases illustrating various forms of arthritis.

Dr. D. MacKenzie: Palpable horseshoe kidney.

Gynæcology: Prof. Harding and Dr. Duncan: New therapy in pernicious vomiting (with method).

Dr. Chipman: Case of idiopathic uterine hæmorrhage with radium treatment; pelvic neoplasm with infection; uterus didelphys; pathological specimens.

Medicine: Dr. Hamilton: Relapsing fever in endocarditis; multiple subcutaneous metastases.

Dr. Martin: Tumour behind optic chiasm; hypopituitarism; acromegaly.

Dr. Morphy: Intramedullary spinal tumour simulating syringomyelia.

Dr. Mundie: Pathological specimens of brain tumours.

Dr. Fry: Sarcoma of the kidney in child (removed eight years ago); illustration of infant-feeding; use of salvarsan per rectum in children; *x*-rays in rickets.

Drs. Bruère and Mason: Case of kerion; ring-worm treated by *x*-rays; general furunculosis following pyorrhœa.

Oto-Laryngology: Dr. White: Laryngo-fissure for carcinoma of larynx; endonasal operation for chronic suppurating sphenoidal sinus; dental cysts; antral suppuration of dental origin.

Dr. Rogers: Angioma of larynx; tumour of nasal pharynx.

Dr. Ballon: Singer's nodes.

Exhibits: Drs. Oertel, Bruère, Crowdy, E. Smith, and MacKenzie: A series of pathological and bacteriological specimens.

Dr. Byers: Microscopical sections illustrating pathological changes underlying failure of Elliott's operation.

Dr. Tooke: Pathological specimens of eye conditions.

Dr. Bourne: Modern instruments and appliances used in anæsthetics.

Dr. Cheney and Mr. McNeil: General series of actinograms.

Dr. Abbott: Apparatus for studying respiratory metabolism.

Medical Societies

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The Canadian
Medical Association Journal

VOL. VIII. AUGUST, 1918 No. 8

PSYCHOGENETIC CONDITIONS IN SOLDIERS, THEIR ÆTIOLOGY, TREATMENT AND FINAL DISPOSAL

BY COLIN K. RUSSEL, M.D.

Temp. Major, acting Lieutenant-Colonel, C.A.M.C.

ONE of the very serious problems we in the medical profession of Canada have to deal with in the returned soldiers is met with in the treatment and final disposal of those suffering from what I have called psychogenetic conditions from the Greek $\Psi\upsilon\chi\eta$ = the mind plus $\gamma\epsilon\upsilon\upsilon\alpha\omega$ = I beget, that is, conditions which are born in the mind. This problem is by no means confined entirely to the medical profession, as I hope to show you, but it is for us first to have a very definite idea of the problem before us so that we may use our professional influence in the right direction.

It is not advisable to go into the details of numbers and percentages of returned casualties who come under this category. You will take my word for it that the problem is worthy of our serious consideration when I tell you that in the French army such cases have practically disappeared, save for the acute temporary conditions which are treated in the casualty clearing line close to the front.

Psychogenetic conditions may be divided into two groups: (*a*) malingering, and (*b*) the neuroses. With regard to the first it is obvious that in one feigning disease or defect, his disability is begotten in his mind. He may feign paralysis or merely pain, or he may feign shell-shock and its varied subjective and objective

Opening communication of the symposium on the "Problem of the Returned Soldier," delivered at the Hamilton Medical Week, May 29th, 1918.

disabilities, or anything else. For the moment I do not propose to go into any discussion of this condition, save merely to point out that it has always been considered the old soldier's privilege to put one over the medical officer by an exaggeration of his symptoms in order to escape duty. One would be entirely lacking in a sense of humour if one took serious objection to this attempt, if not carried to extremes. In war, however, it is our bounden duty to see that the humour of the situation remains on the side of the medical officer.

In turning to the second subdivision of this great psychogenetic group, one must first state that while theoretically there should be a definite dividing line between those two subdivisions, in practice this is often difficult, if not impossible to establish. Let us then consider the group of neurotics, the real sufferers from a mental condition. These might be further subdivided into, first, those with a physical disability, and secondly, those whose complaints are purely mental; though I must say I have been struck with the futility of refinements of classification.

With regard to the former, the disability complained of may vary from the complete paralysis of both legs to a mere limp in walking, from a general trembling or most exaggerated shaking of the limbs to definite and periodical convulsive seizures—from a complete blindness to a complete mutism—from a pain in the back to an inability to stand upright; and one has rather been struck by the fact that these types are apt to appear in epidemics. Early in the war the "trench back" was very common. I have not seen a case for eighteen months or more. The symptoms, then, may be protean. The only point in common in all these cases is that no physical lesion can be found to account for the symptoms complained of. In the case of complete paraplegia there are no pathological reflexes and no bladder disturbances. In the case of the limp, there is no sign of an injury sufficient to justify one in believing it to be the sole cause of the limp; pain is complained of, but *x*-ray examination fails to reveal any bone lesion, and one cannot help having the feeling that if such severe pain as is complained of were really present for such a long time, something would be there to show for it. In the case of the general tremor, which is practically always volitional, there are no pathological reflexes and no suspicion of paralysis agitans, and it is not choreiform. In the convulsive seizures the movements are purposeful, thus distinguishing it from epilsepy; and while the face may become red it does not become cyanosed. The biting of the tongue and passing of urine

might be simulated, but as a rule the tongue is not bitten severely enought to cause laceration. The same thing holds good in those cases of blindness or mutism, no evidence of optic atrophy or paralysis of the vocal cords can be found. In fact these cases are what we have been accustomed to call hysterical, but for which Babinski has introduced the term "pithiatism" from the Greek word $\pi\epsilon\iota\theta\omega$ =I suggest, indicating that the incidence of the peculiar physical symptoms is due to the influence of suggestion on the individual's mind. Other so-called stigmata of hysteria may be found to be present, the peculiar areas of anæsthesia, and the contracted fields of vision, for instance; but particularly the increased suggestibility. In all genuine cases this latter symptom is always present and can usually be easily demonstrated and in fact these so-called stigmata are, as Babiniski has shown, and my own experience confirms, merely evidences of it.

Of course, one must appreciate the fact that just as hysteria can simulate an organic paraplegia, it can also simulate any psychopathic disability.

The second subdivision—those suffering from purely mental symptoms—might be divided into psychasthenics and certain types of psychopaths.* These groups are, however, in my experience relatively unimportant, from a military point of view. Their numbers are relatively small, and I am of the opinion that the war has not been responsible for the initiation of the great majority of them. They are, as a rule (Farrar states in 90 per cent.) an aggravation of a preëxisting condition. It is the first two groups, and particularly the second, which have been greatly added to by the war, and which form our present problem; and I wish to repeat that these two groups merge the one into the other. Of course there are some—fortunately few—who are definitely malingering, and there are others who are definitely hysterical, where there is no room for doubt; but in which group could either of the following cases be put?

Private McK. was admitted complaining of blindness in both eyes, paralysis of the left arm, weakness of the left leg, all of which he stated he had had for six months, following being buried. His occupation in civil life had been as a medical student at Johns Hopkins Hospital, and he had been eighteen months at the front,

* Neurasthenia should not be considered as a psychogenetic condition. I would consider it rather an organic nervous exhaustion, either as part of a complete exhaustion due to prolonged strain, or the nervous exhaustion due to the reflex irritation of the nervous system caused by organic disease.

he stated. My suspicion was aroused, after I had examined him and found no evidence of organic lesion, by the fact that he came to us from the National Hospital at Queen's Square, where I knew it was not the practice to send out such functional cases with their disabilities still present. I should have said he had a complete loss of sensibility to pin-prick over the left hand and arm up to the shoulder joint.

During my first talk to him in my examining room he suddenly uttered an exclamation and regained his sight and power in the left arm and leg, and I sent him to duty around the hospital. A week or ten days later, however, after his affectionate advances had been rather violently spurned by a Ramsgate lady, he came to the examining room apparently quite blind again. I was not altogether surprised, as the young lady's mother had previously consulted me in the matter. As a matter of fact, when he was warned of the danger of the game he was playing, it did not take him many minutes to regain all his faculties, and he was sent to duty in France. His whole story was a tissue of lies. He was not a medical student, and I afterwards learned that when he left Queen's Square, he had no disability at all; he must have developed it on his journey from London to Ramsgate.

Another case of Private R., who was admitted with his right leg completely paralyzed and the left partially so. He had been using crutches for six months and had developed a wrist-drop of his right arm which he thought was due to the crutches. Examination showed the leg swollen and cyanosed, and with complete loss of sensibility to pin-prick extending up to the hip joint. There was loss of sensibility also in the right arm to the elbow joint. No evidence of any organic lesion could be found. After being told that his disability was purely mental, he confessed that it had commenced with a pain in his knee; that he had not used his leg as much as he might have. He stated that he had not done this on his own account but on account of his mother who, sometime after he enlisted, had been left alone and unprotected by the enlistment of his two brothers. He had wanted to get back to her. He stated that in a short time he found that he was unable to move his leg, that his left leg began to become affected, and he had to take to crutches. These very soon caused a crutch-paralysis to develop. Just that morning he stated he had tried to use his limbs and had been unable to do so. He walked out of the examining room perfectly well, and has remained well ever since. In fact, I recently saw that he had obtained a commission.

Evidently in the first case, we have a condition of malingering on a basis of hysteria, and in the second case we have hysteria on a basis of malingering.

I wish to record here some ideas, on the differentiation between psychogenetic conditions of the malingering type and those of a more genuine and sincere type, which evolved during my period of duty as neurologist in charge of the Granville Canadian Special Hospital, and it may be interesting to follow the way in which they evolved.

Certain of these psychogenetic cases I just naturally treated with military sternness, and without much apparent sympathy, simply making them do what they said they could not do, but for which of course I knew there was no organic cause to prevent them. Others I took sympathetically and led them along with reason, persuasion, and encouragement. When asked why I made the distinction I could only answer at that time that my experience had taught me which was the way to take them. As a rule, whichever method I used, worked well. Realizing there must be some underlying reason for the difference in methods, I was led to the following, after reading William McDougall's "Social Psychology".

We have noticed in all these genuine psychogenetic hysteric or pithiatic conditions there is a greatly increased suggestibility which has been produced as a result of the terror under which they have laboured. McDougall, in discussing the emotions of admiration and awe, shows that under the influence of either there is an increased suggestibility. In analyzing these emotions he shows that admiration is made up of wonder plus what he terms a negative self-feeling—a feeling that we are in the presence of a superior power, something greater than ourselves. Certainly we are all in a more suggestible state of mind towards one whom we admire than towards one whom we do not, we are more likely to be influenced by his words or actions.

In the same way in his analysis of the emotion "awe" he shows it to be made up of a negative self-feeling plus wonder plus a suspicion of fear. Under the influence of "awe" we are more suggestible.

Terror, on analysis, is made up of fear with a much exaggerated negative self-feeling element, and here too we have found the increased suggestibility.

In all three emotions we have found the resultant increased suggestibility and the only common factor on the other side of the equations is the negative self-feeling. Therefore the negative self-

feeling must be the cause of the increased suggestibility. When, therefore, I see a man with a psychogenetic disability who is unreasonably antagonistic, self-assertive and inclined to be impudent, I realize that that man has not the negative self-feeling one expects to find in a genuine case, and I feel he is more of the malingering type and trying to deceive me which one naturally does not knowingly permit. Not only that, but to treat these cases efficiently, it is necessary to inspire that necessary negative self-feeling and the consequent increased suggestibility essential in these cases to a rapid recovery. From this one can estimate also the harmful effect of unrestrained emotional sympathy towards these patients. Its tendency will be to produce a positive self feeling which will render attempts at treatment in many cases futile.

It is unnecessary to quote cases of uncomplicated hysteria, such as a man who was admitted with a complete paralysis of both legs which he had had for sixteen months and which had necessitated his being carried around on a stretcher for that period, who nevertheless was made to walk perfectly inside of an hour. Such cases were not at all rare. It is interesting, however, to try and work out the reason for the development of such conditions. To do so we must go back to the primitive beginnings and consider the primitive instincts. We must first appreciate the fact that an instinct is a primitive innate tendency. There are two essentially primitive instincts; the instinct of self-preservation, and the instinct of procreation. These are primitive; they must have been present in the early beginnings of animal life. Their absence in an individual would certainly have assured his not being represented in the present generation. These instincts are born in us. They are tendencies, that is, a constant leaning or urging in a certain direction; and it is only relatively late in the development of man that he has, with the development of his larger brain, learned by experience to control the urging of these instincts. Their urging is, nevertheless, constantly present, and at times, it becomes insistent.

If in an individual there has been a lack of development of the higher centres producing a condition of mental deficiency or feeble mindedness, it will be readily seen that there will probably be less control of these instincts and their peculiar emotions, and in fact it has been found that it is a bad economic proposition to spend time and money in endeavouring to make soldiers of this class of individual. A certain number of these individuals were enlisted during the voluntary enlistment period owing to the enthusiasm to fill up the ranks of a battalion, and many of them have come back diag-

nosed as "shell-shock". We must also recognize the fact that as the necessary mental control involves effort which might be compared to a physical effort, in that it produces physical fatigue, and as we all have our individual physical limitations, there comes a time when this effort becomes wellnigh if not completely impossible For example if a man has stood the strain for six to eighteen months in the line, I personally do not feel like criticising him for losing his control under exceptional conditions.

When a soldier is first introduced to the fighting line, or even under the apprehension of that danger, his instinct of self-preservation will be strongly stimulated, and he will suffer from the emotion peculiar to that instinct, namely, fear. That is natural. Ordinarily the discipline he has learned and his own self-respect are sufficient inducements for him to exert his intellectual power in controlling the impulses set up by his emotions. This intellectual power is, as I have said, a more lately acquired faculty and is more subject to local influences. Lack of sleep or food, or the general malaise associated with a fever, or anything else that interferes with his feeling of well-being, will lessen his intellectual control. Under such circumstances, the sudden onset of some great danger or horrible experience will stimulate his primitive instinct of self-preservation, whose centre is probably in the basal ganglia. The radiations or impulses set up by the stimulation of that centre, like the radiations from a powerful wireless station, jamb the radiations which are set up in the relatively weakened cerebral centres, so that their message can no longer be read. When one sees a man pulling his rubber sheet over him to hide himself from the shells, one realizes that here is a vivid example of the old instinct of flight and concealment, and that such an individual's higher centres are not acting as they should. Under such circumstances, in the absence of the censor as it were, that individual becomes very suggestible. He is in a mental condition ready to believe anything, especially anything that will relieve him of his fear and relieve the anxiety of his guardian instinct of self-preservation.

In studying cases of mutism, for example, one is led to the following interpretation: one realizes that there is a very close association tract between the emotion fear and the voice centres. If a child is frightened, it cries. The warning cry of animals is the cry of fear. Under intense fear the natural reaction is to cry out. Fear is often so intense that the individual cannot cry, his throat muscles having gone into spasm owing to the strength of the stimulus. When, however, that fear is passed, on the individual attempt-

ing to use his voice, owing to the close association tract already mentioned between the voice centre and the centre of fear, there is immediately called up in his mind the picture of the extreme terror he was under. The mind has a natural protective method of suppressing anything that is unpleasant. If one has a recurring unpleasant thought, he will immediately think of something else. He will shove it down out of consciousness. So in this case the thought of the terror being decidedly unpleasant, the mind suppresses it, and with it the voice—so that it will not be recalled.

In the same way the functional paralysis of the arm may result from an injury received when the individual is suffering from great emotional strain. The natural reaction to fear, the quickening of the heart, the shaking of the knees, the profuse perspiration, the involuntary micturition, strange and unaccustomed symptoms to the ordinary individual, become very potent suggestions of organic disease.

Take, for example, the man who after a week with his battery was returned to the special shell-shock hospital suffering from general tremor. When asked what he complained of, he stated that his "nerves were broken", that he was not strong enough to stand the life. When asked if he had been afraid, he asserted rather violently he had not—he had never been afraid of any man. When it is explained to him that his nerves could not be broken, that he really meant that he had lost control of himself, he asserted that he was not strong enough to stand the life owing to the fact that he had heart disease, and that if he had been examined by the medical officer he would not have been sent to the front on that account. Examination of the heart showed it perfectly normal and on being assured of this, he stated that in any case he had done "his bit", and he should not have to go back to the front. He had done fourteen months' duty on the coast defence in England, and he had taken on this position in the early days when there was little or no protection and he had been exposed to all sorts of weather and hardships. When he received the assurance that we did not criticize anybody for being afraid, that it was a very natural phenomenon, he then admitted that he did have his wind up, and in fact he had been very much afraid.

If one analyses this case one sees the natural reaction of the mind in suppressing the unpleasant truth that he was afraid. He violently asserted that he was not afraid of any man. One sees also another natural reaction on the mind in defending the individual to himself. His first defence was that owing to heart disease he

was not physically strong enough and when that was put out of court, his second defence that he had already done "his bit", and that he should not be called upon to go to the front. When it was pointed out that it was hardly just to compare fourteen months on the coast defence in England with fourteen months in the front line, as many of his fellows in the battery have done, he rationalized his whole condition and was in a position to appreciate the injustice of leaving other men to do his share who, though just as much afraid as he was, were controlling their emotions effectively.

One will appreciate that in order to make an individual thus rationalize his ideas and then appeal to his higher control, one takes for granted that he is a man of average amount of intelligence. In the case of the feeble minded, such a method is hopeless.

When one realizes the numberless sources of suggestion, one can appreciate how protean may become the character of the symptoms.

In the treatment of these cases a thorough knowledge and examination of the nervous system is necessary to exclude any organic disease. With the assurance that there is no organic disease present, a broad human charity and a personal interest in the explanation of the individual symptoms are essential. The patient must be made to understand the causative factor played by the primitive emotions, and he must be made to rationalize the ideas which have been set up. In this way his discipline, his self-respect, his higher control can be called upon to take command again.

In this way only can such patients be cured. Any methods of suggestion are insufficient, simply diverting as they do the patient's ideas. Hypnotism which is merely induced hysteria, cannot reasonably be expected to cure; it is granted that by this means the symptoms can often be relieved, it is, however, by superinducing a further condition of hysteria, and the probability is relapse on the first moment of strain and emotion. His condition and disability depending entirely upon ideas, cannot be influenced except superficially by drugs or mechanical treatment. Reason is the only thing that will appeal to or change ideas.

If functional paralysis of a limb be present, it is a simple thing to show him by means of a strong electric current suddenly applied that he has got voluntary power in the limb—once having seen this he will call on it. In the same way the voice can be shown to be unaltered. In cases of tremor, once the real origin of the trouble is accepted by him, if the patient is persuaded to relax the muscles, the tremor ceases. One always notices that these patients when

endeavouring to control the tremor put all their muscles tense, which simply serves to increase it.

When a patient is diagnosed as psychogenetic, one should use equally scientific rational methods with him as one would in the case of any bacterial infection. If the patient comes complaining of loss of appetite and on examination one finds he has typhoid fever, one does not treat the loss of appetite. One tells him frankly he has typhoid fever and gives him treatment which has been recognized as reasonable and proper from a knowledge of the pathology of the disease.

If a man complains of a pain in his back and after the most thorough examination we can find no organic disease, we decide it is a neurosis, *i.e.*, it is mental in origin. Surely it is not the part of science to give him a plaster jacket. Such action will simply impress on the patient still more deeply the idea that he has an organic lesion, and make it more difficult to eradicate.

It is evident that the final disposal of the man and his expectation as to pension will have a decided influence on his condition. If by his disability he is going to escape future danger; and is going to receive a more or less satisfying pension, and his future is going to be cared for without any work on his part, he has small inducement offered to him to make the effort to use his higher control. In the French army this has been recognized and their ruling now is that hysterical disabilities will warrant no pension, no gratuity, and no discharge from the army, that where a definite wound is associated with hysterical disability the latter must not be considered in estimating his pensionable disability, and in no case does such functional disability warrant discharge from the army. The result of the putting into practice of this legislation is that it is not worth while to develop shell-shock in the French army.

It is worthy of notice that so called shell-shock is not observed among our German prisoners. These men have been under the same strain and exposure that our men have been subjected to. The only difference is that, they, being prisoners, know that they will not be again called upon to enter the firing line and they are no longer under any apprehension of danger. Their instinct of self-preservation, in other words, is at rest, and there is no question of pension to have its influence.

In England, on the other hand, a very different state of affairs exists, and it is only recently that efficient methods have been adopted to treat these cases in special hospitals. Previous to that many were discharged to civic life with a fairly big pension. It

was a common experience that even in civic life many of these were inefficient.

Sitting on the special medical board which dealt with these cases one would see men who had been discharged some months to their own control, who had again become total disabilities. Let me quote two typical cases: One had been discharged from the hospital to return to his command depot. On the train while leaning out of the window an engine in the neighbourhood whistled. He immediately fell back in the compartment, shaking all over, and was returned to the hospital a complete disability.

Another who had been discharged to civic life and had been carrying on for some months, while in Paddington Station one day there was an air raid warning. Everybody moved towards the underground, this man with the others. An engine in the station whistled: in his own words, he fell down in a severe hysterical convulsion. Somebody threw him into a baggage car, and the train ran out of the station. Its first stop was at Taplow, and he was taken off and sent to the hospital there. When seen, he was walking with crutches, dragging his legs behind him.

In neither of these cases was there any sign of organic disease found. They had been startled by an idea and had lost control of themselves. Being a pensioner, this latter patient would be advised to go to the first home of recovery, a fine old house in beautiful grounds with a fine billiard table and interesting occupations found for the patients. While there he would be receiving 27s. 6d. a week, with 13s. for his wife, and so much for each of his children. He would live there for six weeks or two months like a gentleman of means, well cared for and well fed, and with an interesting occupation. At the end of that time if sufficiently recovered he would come to the special medical board and might well receive an increase to his pension on account of his nervous instability. Now, we saw in the first place that his condition was due to an idea, and we must realize that only reason will appeal to an idea. If all the reasons that are being given a man are such as to encourage him in his condition, it is hopeless to expect that his ideas will be influenced beneficially.

It therefore seems to me essential that in dealing with this type of case in Canada we must first of all follow the plans which have been adopted in the French army, and in the British army in France. We must have special hospitals where these patients will be segregated immediately on their arrival in Canada. These centres will be under the supervision of specially trained men;

secondly, that no patient showing gross objective functional disturbance shall in future be discharged from the army; thirdly, that such psychogenetic conditions shall not warrant any pension or gratuity; fourthly, in the event of such patients relapsing in their condition after their discharge from the army, they shall be returned to the special neurological centre from which they were discharged.

In psychasthenics, where pre-war disability can be demonstrated—and Captain Farrar states it can be so in 90 per cent. of the cases—it should, by appropriate treatment, be reduced to as near the pre-war disability as possible, and they should be discharged without pension or with pension covering the estimated amount of the aggravation.

With the carrying out of these recommendations one could justifiably hope for: first, the return of a greater number to military duty; secondly, a greater efficiency in civilian occupation in those discharged to their own control; third, a very decided diminution in the amount of pensions.

With regard to the feeble-minded to whom we have made reference. One recognizes that this condition of mental deficiency was not induced nor aggravated by military service in the great majority of cases. In what way should they be disposed of? When discharged, many of this type drift back to the hospital for a while at least, usually on insufficient medical grounds. While we recognize that this disability does not warrant a pension, it is my opinion that from a national economic point of view, the state should become the guardians of such individuals. They should be collected into colonies where they might be made partially self-supporting at least, under supervision, otherwise they will become the tramps, ne'er do weels and criminal class always so greatly augmented in the train of war.

CHIRURGICO-ORTHOPÆDIC OBSERVATIONS AND THE MORAL TREATMENT OF THE WOUNDED MAN

By Colonel Irving H. Cameron, C.A.M.C., C.E.F.

FOR four and forty years I have been coming to these meetings and in the early days Osler was Secretary of the Canadian Medical Association, and, with his encouragement, I spoke much and oft, fuller of speech than thought, but "the years which make the stripling wise" were not slow to transmute with radiant energy the so-called silvern speech into golden silence. Johnson tells us of another unfortunate whose silence is commendable, as I have long felt mine to be, when he writes:

> "Superfluous lags the veteran on the stage,
> Till pitying nature signs the last release,
> And bids afflicted worth retire to peace!"

And so, Mr. President, I do not come here to-night *mea sponte mera*, to break the silence I have long preserved, but by command of my respected chief, the D. G. M. S., "to show his love and friending to you," and in his name I give you greeting.

I see that I am set down to make some general surgical observations with special reference to orthopædics. What I would wish to say upon this subject has been already recently and better said by Captain F. C. Kidner, of Detroit, in giving an account of the work being done at the orthopædic centre at Shepherd's Bush in London, with its eleven hundred beds and excellent equipment under the control of Sir Robert Jones, which account is published in the *Journal of the American Medical Association* in its issue of April 27th last. I shall therefore refer to it only in the briefest possible way, and then say, with your permission, a few words on a branch of the subject more directly germane to the symposium on the Returned Soldier Problem. Possibly you will pardon me—and I shall make that assumption until called to order by the Chair—if I make an allusion in the beginning to the word "Orthopædic."

From the symposium on the "Problem of the Returned Soldier", delivered at the Canadian Medical Week at Hamilton, May 29th, 1918.

And here, upon the "rim" I regret to find myself separated *dimidio caelo* from "the Hub," for the *American Orthopædic Association Journal* (Boston), has, if I remember rightly, an indication on its front cover page, that they derive it from the two Greek words, ὀρθός = straight, and πούς = a foot. Now while this might do very well for the days of the small beginnings when tenotomy for club foot, and occasionally for contracted knee or hip or torticollis, was the chief operative procedure in orthopædic surgery, yet when, later on, the other congenital or early acquired deformities of children, and particularly the tuberculous joint affections and paralysis of the extremities and spine were added, the ground became too large for the "foot" to cover and the root was shifted to παιδικός = pertaining to a child and ὀρθόω = I set upright (one fallen), rebuild, restore. But in these days of "vaulting ambition", when the tail sets up to wag the dog, if the orthopædists want to chew what they have bitten off, they will have to adopt and make good *my* etymology of ὀρθως = rightly and παιδεύω = I rear, educate, train or bring up. It is interesting to note, in passing, that Herodotus speaks of ξύλινος πούς = a wooden or artificial foot; but, possibly, he refers only to a "peg leg", one of the best and most useful and least costly substitutes to be found.

Fifty years ago orthopædic surgery received an impulse of development by the advent of Sayre and the two Taylors (*Pater et filius*) in New York, and Bauer in St. Louis, men of force and enthusiasm, and, as an old pupil of Lewis Sayre, I cannot forebear expressing regret at the extinction of the type of such strong and sturdy men and keen and forceful preceptors. On "the Continent" there were some strong exponents of the reviving spirit, and, in England, Little of Bristol, and Adams, Barwell and Bampfield, Roth and Heather Bigg and Howard Marsh in London, and Thomas of Liverpool were varied types of the chief masters of the art, but "it was nothing more", lacking pathology, for the "pallid bust of Pallas", Minerva, had not then cast either her light or her shadow on the handicraft. But the dawn was breaking.

These men, *et hoc genus omne*, were great surgeons too, and each contributed from his general experience some special ray of light upon the problems, and all had force and faith, merit and ability; but to America, I think, we must award the palm for the initial impulse which has transformed the scene and caused the tillers of a corner of the field to usurp the whole. For what do we find to-day under Robert Jones's generalship and strategy? Listen to his "Classification of Orthopædic Cases" in the British army:

1. Bone lesions; ununited and malunited fractures.
2. Nerve injuries, complicated by fractures and contracted scars, including nerve suture.
3. Acute and chronic disabilities of joints, including ankylosis, and loose or fractured semilunar or other cartilages.
4. Injuries of muscles, ligaments and tendons, and stiffness of joints.
5. Deformities and disabilities of feet, such as hallux rigidus, hammer toes, metatarsalgia, painful heels, flat and claw feet.
6. Cases requiring tendon transplantation and other measures for relief in the irreparable damage of nerves.
7. Cases requiring surgical appliances. And in Canada, owing to our peculiar and advantageous conditions, Lt.-Col. Clarence Starr has contrived, and the D. G. M. S. has connived, to add an eighth including,
8. Amputations and stumps requiring trimming and fitting with artificial limbs.

On contemplation of this very formidable list it does not occur to one that the professors of capacity and ability to reëducate, rebuild and straighten out all these crookednesses and defects and deformities and to set the victims of them upright on their feet again can be suffering themselves in any wise from deficiency or defect in nerve or bony framework; but, on the other hand, one must be convinced that they measure up pretty well to the standard of a man, capable of undertaking the work of a general surgeon.

And knowing both Colonel Robert Jones and Lieutenant-Colonel Clarence Starr intimately and well, and recognising to the full the sufficiency and efficiency of each (*capax, perspicax, sagax et efficax* as each is) I am content that they and all whom they can bring up to their level should till the whole field that the handicraft of surgery can cover, with the aid of all the ancillary sciences combined with the arts and crafts which go to make the *mens sana* and the *manus medica*—the just judgement and the healing hand.

The article of Captain Kidner which I have mentioned gives abundant illustrations, and I feel that I must refer you to it instead of quoting from it as I hoped to do had time sufficed. And very likely my surgical colleague who follows me (here as he did at

Orpington) may make reference to it.* But the whole story reiterates and reinforces the dictum of Matthias Mayer, himself a veritable orthopædic surgeon, when he declared "*Simplex sigillum veri*" (as witness the peg leg and Thomas's splint). Simplicity is the seal of truth; duplicity and complexity are the zeal of error.

But, not to exhaust your patience on half my theme, let me now take a hurried glance at the returned invalided soldier question, and it is my intention to view it from the critical, the unpopular and unfashionable viewpoint. In a speech by Mr. Elihu Root, at Convocation (University of Toronto) the other day, I heard him reaffirm and assert the sovranty of the individual as opposed to the State—the heresy and error of the radical political economists of England (mostly Scottish, as usual) of the eighteenth and nineteenth centuries. The returned soldier, like Mr. Root, holds to the doctrine of the supremacy of individualism, which is worse than Bolshevikism. He thinks his obligation to the State is settled and ended, and that the State owes him everything, unmindful of the basic fact that the State does not, and never did, owe him anything except equality before the law, and equal rights with those similarly circumstanced with himself—an obligation which it still acknowledges and still discharges. The absolute liberty of the individual began to wane in the nomadic and patriarchal state of society and has been diminishing ever since, to reach extinction when the commonwealth is at war and its existence jeopardised, at which time considerations of the public weal over-ride all others, and even the voice of the civil law is suppressed, amid the din of arms (*silent enim leges inter arma*). Because this essentially sound doctrine has been pushed to an unjustifiable extremity in Germany is no reason why Bolshevikism and anarchy should be set up here. For all extremes are errors, the truth usually lies between, and Germany's present efficiency is the proof of which extremity is the lesser evil in a State, if we must tolerate "the falsehood of extremes".

Let us not mince matters, and let us look the situation squarely in the face; and, be it remembered, that, in the Army Medical Service, we are dealing with the maimed and the enfeebled, the mutilated and the exhausted, the malingerer and the evader, and so may easily acquire an exaggerated notion of the shirking and the pusillanimity of some of our Canadian youth, so many of whose

* Captain Kidner's name creates a prejudice in favour of his article because we know how full of energy and information his homonym is in the I. S. R. and therefore expect great things to be associated with it. Those of you who have not read the article will find it well worth perusing.

comrades have given proof of courage and endurance, of chivalry and devotion never exceeded in the annals of the race.

How many returned soldiers does one meet anxious to go back to the fighting line, to relieve or to reinforce the comrades they have left behind? How many does one see anxious to promote by every means their speediest recovery so as to be able at the earliest possible moment to join the army of industrial workers who provide the material sinews of the war; or even to do a day's work or earn an honest livelihood to render them independent of maintenance by the State? In your experience are they few or many?

If many, how shall we account for this decadence of manhood, this laxity of moral fibre, this vanishing virility?

I lay it to the charge of a sickly sentimentality. Self-commiseration is inherent in and natural to us all, and has no need of cultivation or reëducation; and she was a wise, if a Spartan, mother of heroes, who in the golden age of Greece could give her son departing to the wars a shield coupled with the injunction to bring it back victorious or come upon it; "ἢ τὰν ἢ ἐπὶ τάν," she said. A world of meaning in those five words, and second only in their wealth and burden of pathos to those two uttered by the Greek father—you will find them in the Œdipus of Sophocles, but they are also written large in the family annals of to-day—when he found his son numbered with the slain: Ὦ παῖ! My son, my son!

Let us take an other example of "the brave days of old" as Macaulay calls them, and summon back an instance of 458 B.C. to contrast with these degenerate days. The Roman army under Lucius Mincius is caught in a deep defile of Mt. Algidus by an Æquian host, and its doom seems sealed. A meeting of the Senate is hurriedly summoned and delegates despatched to Lucius Quinctius Cincinnatus, whom they find calmly digging in a field on the other side of the Tiber and tell him that the Senate has named him Dictator, and that he must proceed forthwith to succour the entrapped army. Without parley or ado he gathers his reinforcements and proceeds upon his mission. The Æquians are routed and the Roman army saved, and Cincinnatus returns to Rome and lays down the Dictatorship and is back on the farm in sixteen days—

> From the field of food to the field of fight,
> And back to the farm in a fortnight's flight.

This, indeed, is an incident to point a moral as well as adorn a tale. Are there any on our farms now anxious to take the field to relieve the war worn heroes in the trenches? Five thousand agriculturists

invade the Senate house and blatantly demand an opportunity to answer "No"; and "Shout in Folly's horny tympanum such things as make the wise man dumb". How many who now "see Death entrenched preparing his assault" would gladly seek the furrow with the plough, but delay, when they do return, to fill the places which conscription has made vacant in the ranks of those who fought the enemy, no less, when they fed the allies with the forced labour of increased production?

Can you divine the cause? These heroes of ours went boldly forth to war, instinct with the spirit of freedom, each with Mr. Patrick Henry's sentiment in his mouth: Give me liberty, or give me death! They followed the Apostolic injunction to the letter: they quitted themselves like men; they were strong to endure, many to die! For, as Dryden has told us:

> The love of liberty with life is given;
> And life itself the inferior gift of Heaven.

The strain to which they were subjected, the descent into Hell, naturally tried to the uttermost the "distracted globes" in which reason and self control erstwhile had residence and made them supersensible to self-suggestion.

They return, many of them, wounded and broken men—but men. But men made supersensitive to suggestion of the false and suppression of the true, with morale depressed.

And how are they treated? Sensibly and rationally enough until they reach the Base. And then, Presto, change!

No sooner are they transferred from ambulance to bed than well-meaning, but too sympathetic padres and matrons, nursing sisters and V.A.Ds., surround them with cigarettes and matches (hairs of the dog which has already bitten them to distant, perhaps, but untimely death) and with creature comforts, sedulously and emulously endeavouring to anticipate every want, but never forgetting or omitting "the accursed weed". And, as if this were not enough to disturb the balance of a mere and common man, the next day and the following days, *ad infinitum*, so many ladies of high degree, of wealth and fashion, so many men of eminence and attainment in church and state, put themselves and their belongings, their houses, chattels, goods and gear at the service of these unfortunate men that they naturally and inevitably begin to think more highly of themselves than they ought to think for having done their duty, however nobly. And Plautus has said: *Is est honos*

homini pudico, meminisse officium suum. "To a modest man, it is an honour sufficient to have remembered his duty." But it is nothing more. It were a disgrace to neglect it.

Thrice have I seen wounded men die with lighted cigarettes between their fingers, and these, of course, were none the worse; and three times have I known other three smoking surreptitiously at night, in bed, what Burton in his "Anatomy of Melancholy" has called "this damned, devilish, hellish" incense. Add then to this the ridiculous editorial laudation, and the effect of the absurd and extravagant speeches made on the floor of Parliament, and the irrational and inordinate claims at times advanced by various organizations for patronizing the returned soldier, and given a nervous system made over-susceptible to suggestion—hypnotized or mesmerized or Braidised or what you will—and with its own inherent saving common sense starved by disuse and choked by eulogy, and what more logical "conclusion to the whole matter" can we expect than that which we find?

In the strong Saxon speech, then of one of my colleagues, Highlander though he be, gifted with more common sense than most of us, "Cut it out"!

Cut out Venus and Bacchus Let their shrines be empty! And here grant me the favour of, a digression suggested, nay compelled, by this chance reference to Venus and Bacchus, inseparable in my mind henceforth "while memory holds her seat in this distracted globe" from association with one of our best and brightest, "sanest and most obedient" to the highest laws of life, as wise as he was witty, as competent as clear sighted, as devoted to duty as dearly beloved of gods and men, whose clarion call to those who "carry on" graces and sanctifies your programme's page to-day after that long roll of worthy names to which with averted heads and hands thrice filled with dust we answer, sorrowfully, yet proudly, "Dead on the Field of Honour!" I refer to our deeply beloved colleague, the late Lieutenant-Colonel John McCrae.

But to my story: The scene an ocean liner; the subject the Greek Anthology, picked up by one of us in Glasgow; *personæ*: three friends, a clever classical lady from Kingston, Lieutenant-Colonel John McCrae and the narrator. The object: Amusement. The means: Translation of *Rufinus's "Love and Wine"*.

Professor Mackail's translation (Professor of Poetry at Oxford) follows:—

"I am armed against Love with a breastplate of Reason, neither shall he conquer me, one against one; yes, I, a mortal will contend with him, the Immortal; but if he have Bacchus to second him, what can I do alone against the two?"

John McCrae's rendering, extempore and impromptu:—

> Me, a mortal, single-handed,
> Love immortal can't subdue;
> But the God with Bacchus banded,
> Cuts my breastplate Reason through.

And now to conclude, at a long last, my rede upon the Returned Soldier Problem, is:—

Cut out Venus and Bacchus. Cut out adulation and flattery; and undue praise. Speak the words of truth and soberness. Take the advice of Homer, and cut out the sophistries and euphemisms in which "Follies are miscalled the crimes of fate". Combine work and play, pleasures and exercise. Lead thoughts along the lines of cheer and hopefulness, and banish melancholy. Cut out indulgences, cultivate thrift, temperance in all things and sobriety in judgement. Cultivate "honour and clean mirth" amongst the men. Assist the returned men to develop their own self-respect, and spirit of independence and self-help; and eschew sentimental molly-coddling. Teach and help the men to investigate conditions and understand them before assuming that the authorities are in the wrong. Regard them as younger brothers and reprove them with sympathy and understanding accordingly. Encourage them to avoid and to despise, as unworthy of men, all trashy and solacious literature, and to read books which are at once useful and entertaining, through biographical association and illustration, such as Samuel Smiles' "Self Help," "Character," "Duty," "Thrift," and such like; books which they will finish with enjoyment if they begin them, and which John Murray publishes at a shilling apiece. Books which I have not found in any hospital library from ocean to ocean, nor on the bookshelves at Ottawa. Substitute for inane and silly moving pictures and trashy plays films of natural history and such like topics, and illustrative lectures which embody and improve the advice, "Go to the ant, thou sluggard, and learn wisdom; and to the bee and get understanding." Teach the men by counsel and example to prefer "the things which are more excellent." Likewise, and by the same means, inculcate the old Stoic doctrine of the essential necessity of "self-reverence, self-knowledge, self-control, which three alone lead life to sovereign power; yet not for power; power of herself would come uncalled for, but to live by law, acting the law we live by without fear, and, because right is right, to follow right were wisdom in the scorn of consequence." But if this ideal seems to them too high, then let them take Matthew Arnold's "*Second Best*" and make it their own, incorporate in their daily life.

THE SURGERY OF NERVE INJURY

By Hadley Williams, M.D., F.R.C.S.

Lieutenant-Colonel, C.E.F.
London, Ont.

A PERFECT nerve supply is so important to the individual that when a large mixed nerve of the arm or leg is badly injured (such as the sciatic or musculo-spiral) the disability is at once severe and, until rectified, the limb practically becomes useless. Realizing that there are many types of injuries, from simple bruising, to complete division, as well as involvement in scar tissue, callus and the like, this paper deals only with the direct surgical treatment of a divided nerve, and the best procedure to give the quickest and surest result. Since the first case operated nearly seventeen years ago, the largest number, of course, have been met with during the war, and comprise those overseas and on service in Canada. It is for this reason that one can only speak of actual results in a few of the earlier cases, since those of a later date will only be properly placed at some future time. Opportunities for study at the present, on account of the war, are greater than ever before, a very large number being now available. After the all-important necessity for relaxation of muscles; attending to movements and massage of joints; the use of splints and electricity, so that when the nerve is restored it will be in the best receptive condition for the return to normal function, questions arise that are many and important.

Did the injury cause immediate paralysis partial or complete, and, if not, how long after? Was it noticed only after the splint was removed or callus had formed? Was the wound septic and so on? The most complete history therefore is essential in arriving at a diagnosis of the condition of the nerve. If the paralysis is immediate and complete, the nerve is more often completely divided (though not by any means invariably so). If the latter, the chances are in favor of involvement in scar tissue, or callus, or resulting

From the symposium on the "Problem of the Returned Soldier", delivered at the Hamilton Medical Week, May 29th, 1918.

from sepsis. One is impressed with the fact that nearly all of these wounds reaching a base hospital are septic, arriving as they do some days after injury at the firing line. A clean wound is indeed a great rarity. Since nerve sutures in bullet wounds, at least, are necessarily nearly always secondary, sepsis plays a most malignant rôle. From choice, one would not think of cutting down in this condition but would rather wait some months after the wound had completely healed. There is no arbitrary rule on this point and must be left to the judgement of the surgeon, still four months for ordinary infection and six or more for the gas bacillus seems to be fairly general.

The treatment adopted by the staff of the Ontario Military Hospital during my service there was to leave these cases alone, to make no dissections or attempts to find the nerve, but to treat the septic condition under general surgical principles. For instance, there was a ward completely taken up by Carrel Dakins' method of treatment for all kinds of wounds, but at the same time other solutions as boric acid, plain boiled water, iodine solution and the like were tried in order to arrive at some comparative value of these various preparations. If complicated by paralysis, it was only after the wound had completely healed for some time that we dared an investigation. There were median and ulnar nerves bound down in scar tissue, likewise the cords of brachial plexus in two cases from shrapnel bullets; some sciatics and an anterior crural, a few in callus and the like, and occasionally a nerve without any apparent injury whatever.

In uniting a musculo-spiral this spring, involved in callus from severe gunshot wound, of the right arm, a reinfection took place after the wound had been completely closed for ten months, so one never really knows when this condition will occur, and yet my first case was undertaken seventeen years ago under similar conditions but with excellent results, as will be shown in a few moments. Although the wound should be healed first and repair made afterward, yet, if one can see the ends of a large nerve in a septic wound, the proper course to adopt would be to unite them at the time if the process does not involve actual dissection. The nerve will be improved by being brought in continuity, with a minimum amount of scar tissue between the ends, and will be easy to find later if necessary, and not be so widely separated and blocked by scar tissue. On this point one sees an exception to the general rule. When a case presents itself to the surgeon he must ask the question: "Is the nerve divided or bruised?" since in so many cases injured

nerves give the same symptoms as one completely divided. Can anyone distinguish between them? The general opinion is in the negative. Neurologists give differences in sensory, motor and electrical signs, but no one is absolutely certain. Some of my cases which were later found by operation to be bruised but not divided, gave the one almost constant symptom of pain and in some this was excruciating. A man was struck on the ulnar nerve at the elbow by the corner of a falling door causing complete paralysis, followed by severe pain which lasted three weeks and necessitated the use of morphine. The course suggested was incision into the sheath for relief of tension, but this was not done. The paralysis lasted six months and two weeks, and took apparently the regular course of a divided nerve. One author says "diagnosis can only be made when the nerve ends are actually seen". This being the case, what is the proper procedure? If you operate, the nerve may be intact, therefore nothing to be done. If, on the other hand, you wait the regulation eight to twelve months, you lose a valuable amount of time, and after suture another year or more for success, during which period the muscles and joints are without their trophic stimuli and must be kept constantly in condition for the moment when the nerve is restored. It is advisable not to wait, but, if other conditions are favourable, discover the exact condition by operation and not waste time.

Operation in some of these cases found the nerve slightly irregular and apparently thicker in places, but undivided. A discussion of this type is beyond the scope of this paper. Suppose the condition being favourable, the operation is performed and the nerve found to be divided, you all know the condition met with. The ends are more or less widely separated, buried in scar tissue, frayed out or bulbous. Larger on the proximal and smaller on the distal end. But this latter does not always occur. In a sciatic suture (early part of March—McC.) the distal end was distinctly larger than the proximal (a very rare condition), the only case that has come under my observation.

What is the procedure? The answer is quite easy if one can approximate the ends without tension. But suppose you are met with the problem of five or six cm. shortening and the nerve cannot possibly be brought together. That is a different story. One of these cases was the ulnar nerve in the forearm with a loss of 5 cm. and the ends were united with strands of catgut and surrounded by a complete sheath of fascia. One year after there was some slight improvement (Scott, March 7th, 1912) but never a satisfactory

recovery, in fact, practically a failure. Another involved the median and ulnar, where the latter was destroyed for over six cm. by the teeth of a binder. The upper and lower ends were buried in the sheath of the median nerve (lateral anastomosis—early November, 1906). This case was much more successful than the last, but not by any means complete, though some considerable function was restored. So that from all one gathers from cases both actual and experimental, the various methods in use at the present time in bridging a wide space are far from encouraging, as compared with the direct end to end anastomosis. Indeed one explores the literature to find a few successful cases.

When the latter cannot be accomplished, a piece of the same nerve split and turned down to fill the gap is far preferable to any foreign substance, even a piece of nerve taken from other part of the body, but with this the results are far from satisfactory.

Although in end to end anastomosis, the restoration of the nerve's continuity is no guarantee of its ultimate recovery, this, after all is undoubtedly by far the most rational and successful method. This being the case, how much greater must be the difficulties of recovery when substitution has to be made by bridging with various foreign substances. Time does not permit any discussion of these methods, so well known by every surgeon present, except perhaps mention may be made of a piece of artery or vein filled with agar-agar or some other medium through which the axis cylinder may grow. But any tube which collapses and allows scar tissue to come between the ends will likely be doomed to failure, because it seems almost certain that blocking of the path by non-penetrable scar tissue is the greatest cause of failure after suturing divided nerve ends. By far the best method then, the surest and safest, is to bring the ends together accurately, stripped of all scar tissue and bulbous overgrowth, until the nerve-bundles are easily seen and the ends bleeding slightly, with a suture directly through the nerve one cm. back, accurate coaptation, and held in that position. Muscle was used in some of these cases but a pad of fat or fascia equally insulate the suture line. Is it not remarkable that in division of the fifth nerve every scheme a surgeon can think of is tried to prevent union and yet, in ten or twelve months, the neuralgia returns as formidable as before, yet, in the nerves under discussion, a return of function is one of the most difficult problems in surgery!

Now, after a consideration of all these different methods and passing judgement on the results, what can be done where a large

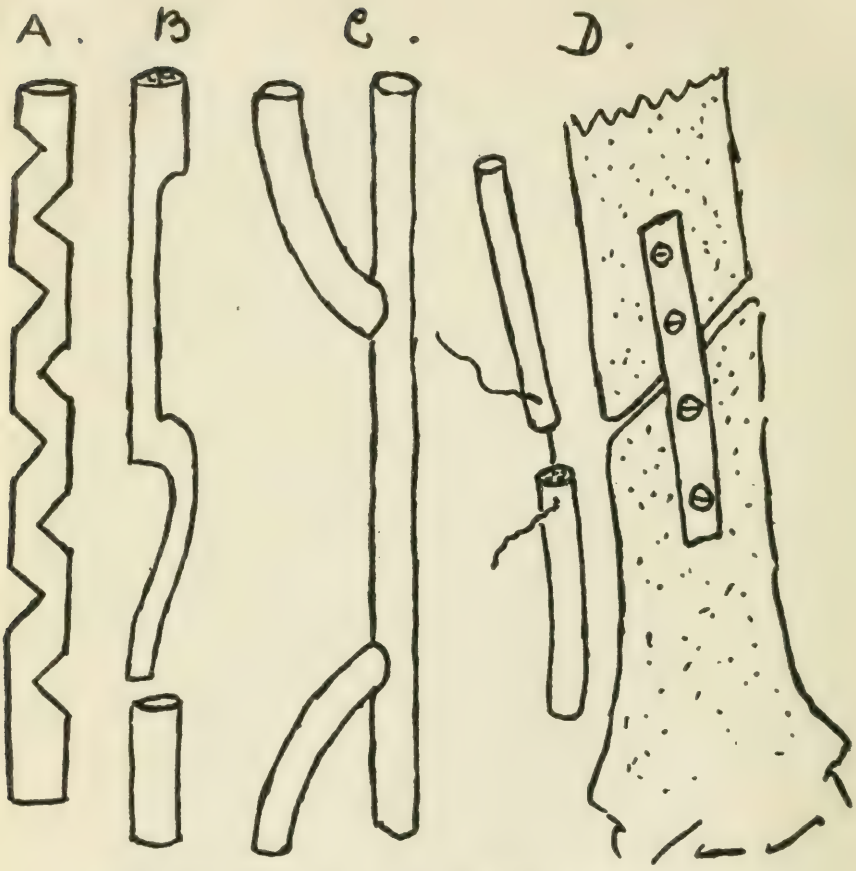
nerve such as a musculo spiral is entirely destroyed for six cm. or more and cannot possibly be brought together. The answer to that is the removal of a part of the bone to obtain the desired effect. Join the nerve in the most approved manner, plate the bone, place fat, muscle or fascia to prevent involvement in callus, put the arm up in the most relaxed position for all affected muscles (taking care to attend to all details on tendons and joints), and rest with the almost sure conviction that, in a reasonable time, sensation will return and the arm again be a useful member. It seems foolish to fiddle and experiment in such a crisis, since we know that direct suturing offers practically the only chance for success; when the patient's future usefulness is at stake (especially if the right arm be involved) and if he is compelled as the majority of us are, to earn his living by the sweat of his brow. In order to illustrate this in a practical way, this man consented to come here to-day for your inspection.

In the winter of 1901 (some seventeen years ago) this patient received a wound in his arm from a No. 12 shot gun while on a shooting expedition in the woods of Pennsylvania. The bone was fractured and the musculo-spiral completely paralyzed. Fifteen months later he came under my care. The sinus was still discharging pus, and paralysis was complete. The patient requested amputation. Being a young labouring man in the early twenties, with a long life ahead of him, this suggestion was ignored and operation attempted to suture the nerve. March 22nd, 1902, I dissected out the musculo-spiral nerve below and above. The ends were brought in apposition after six centimetres of bone had been removed. Fascia was placed between the nerve and the bone to prevent callus involvement and a drain was inserted on account of a septic sinus being present. The nerve was cut back with a sharp knife until the bundles were distinctly seen and blood oozed from the ends. These two factors undoubtedly form the ideal conditions for successful union. Silk sutures were used in this case. For four weeks discharge of pus kept up but greatly lessened. Eight weeks later there was no union of the bone and it was decided to use a plate.

July 30th, 1902, a silver plate was made by a local jeweller and with four screws was placed in position and the arm and shoulder encased in plaster of paris.

September 10th, 1902. The plaster was removed and firm union found to be established.

December 12th, 1902. An operation was then performed to



VARIOUS METHODS OF FILLING THE GAP WITHOUT THE AID OF A FOREIGN BODY

A. Cutting nerve on either side to elongate it.

B. Slicing a section off to fill the gap.

C. Lateral anastomosis of ends into another nerve.

D. Removal of bone, with plating, to bring nerve ends together.

remove the plate, the patient having fallen from his bicycle a month before, and three screws having worked out of the wound. Sensation returned in six weeks and motion on September 16th, six months and two days. This was first noticed by extension of fingers, then the wrist, and the movements of the thumb last.

October 1st. All movements were complete.

It is asserted that "After secondary suture epicritic sensation never returns." It is present in this case.

If you will allow me to say so, it seems that this was one of the first if not the first plate used in this country for uniting bone (now seventeen years ago) and the only case, as far as can be found by me in the literature where bone has been deliberately sacrificed to unite a large nerve.

ON THE ROLE OF PHYSIOTHERAPY IN THE TREATMENT OF THE RETURNED INVALIDED SOLDIER

By Lieutenant-Colonel Robert Wilson, C.A.M.C.
Consultant

THE hour is late and whatever I say must necessarily be brief. You have heard several aspects of this large and intensely interesting problem of the returned soldier treated from the point of view of the general surgeon, the orthopædic surgeon, and the psychopathist. All would be more or less futile were they not followed by suitable after-treatment; all, at any rate, immensely helped by a proper use of those methods to which for want of a better, the name of Physiotherapy has been applied. Those methods which some of us in Canada were wont to look upon a little askance, adding to the number of mistakes which perhaps want of interest, with its resulting want of knowledge, has been responsible for, leaving them largely in the hands of those insufficiently trained in the higher branches of our art.

My purpose in addressing you to-night is to draw attention to these methods, and to mention briefly their place in the scheme of the treatment of the returned invalided soldier. Let me at once point out that the pieces of apparatus you have seen being used upstairs are only a few of those designed for muscle function training, and that though important and perhaps more spectacular, this department is only one of the many means at our disposal, and obviously only of use after surgical or other intervention on nerve, tendon, or joint, has made the return of muscle function possible. I want to emphasize this, because to those not familiar with modern physiotherapy, one is apt to get an exaggerated idea of the importance of apparatus, and overlook the principles underlying their use.

Humanitarian principles, military exigencies, and sociological and political economics, have combined, as the result of this world

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From the symposium on the "Returned Soldier Problem", delivered at the Hamilton Medical Week, Hamilton, Ont., May 29th, 1918.

war, as they otherwise never would, to make the question of the repair and rehabilitation of its human waste one of paramount and immediate importance; lessening the number of cripples; increasing the amount of effective fighting material; increasing the number of those available for industrial production; and so lessening the economic burden of the general population of the future by lessening the pensionable disability. May I quote two examples before I outline the plan we have found by experience to yield the best results? The Granville Canadian Special Hospital at Ramsgate was the first of its kind in England. It was opened in November, 1915, and it was my privilege to organize the treatment departments there. In the fourteen months from November, 1915, to December, 1916, 4,399 patients were admitted, of whom 1,795 were discharged to full duty, six hundred and sixty-three to light duty (with seven hundred and seventy-two invalided to Canada, and four hundred transferred to other hospitals). Thus 2,458 men were taken off the pension list and returned to active military work, and these were all of the class known as "crocks", who in the ordinary course of events would have been invalided to Canada for discharge from the army, and pensioning. At Epsom, another of our large treatment centres, the percentage of men returned to their reserve battalions was 20 per cent. greater than from ordinary convalescent hospitals where physical methods were not emphasized. The point need not be laboured.

In the scheme devised for our hospital centres in Canada, treatment departments have been provided, to be under the care of a medical officer specially trained. "*Eau courante*" or whirlpool baths and hydrotherapy in its various forms, massage, electrotherapy in its various applications, radiant heat, muscle-function training, gymnasia, with the necessary appliances, and a definite routine of work, games specially chosen or designed for their therapeutic effect, workshops for occupational therapy, where the thing made, whether of æsthetic or practical value, has been definitely chosen for the therapeutic value of the work necessary to make it, and not necessarily having any correlation to the previous occupation or elective desire of the patient; and finally the graduation of the patient into the purely physical exercise class, or his discharge to civil life, with his pensionable disability reduced to a minimum.

Such is the plan now in process of being carried out. To provide the necessary personnel, the institution of a school has been found necessary, where these methods may be taught. Such a

school is now in active work at Hart House, Toronto; it is known as "The Military School of Orthopædic Surgery and Physiotherapy". Here both medical officers and army medical personnel, physical training instructors, and female civilians are being trained.

Were I asked to emphasize any points in this work, it would be to say that the surgeon or physician of the future will have to familiarize himself with these physiotherapeutic measures; secondly, that they are indispensable as an aid to the surgeon proper, and thirdly, that they are in most cases only an aid, albeit indispensable, and that the officer concerned in administering it must work in the closest harmony with the surgeon originally responsible for the repair which makes the physiotherapist's work possible.

WITHIN a few months Alberta has been able to get the Municipal Hospital Act into workable shape, and to have four public nurses in the field. Edmonton and Calgary will have among their exhibition features a demonstration of public health work under the direction of these recently appointed government nurses; talks on general health lines will be given, together with a display of literature and posters.

INDUSTRIAL REHABILITATION

By H. E. T. Haultain, C.E.

Vice-President, The Engineering Institute of Canada, Vice-President, The Canadian Mining Institute, Member of the Institution of Mining and Metallurgy, etc.

Professor of Mining Engineering, University of Toronto

Professor Haultain was unable to wait for his turn to speak, but if the occasion had permitted, he would probably have spoken somewhat as follows:

Mr. Chairman, Ladies and Gentlemen:—

THE hour is late, and you have had a long and strenuous day. It would be entirely out of place under these circumstances, to attempt to give you an adequate outline of the work of the vocational branch, but I cannot let this opportunity pass by without attempting something. I have been Vocational Officer for the Province of Ontario for about eight months, in charge of the work in Ontario of the Vocational Branch of the Invalided Soldiers' Commission of the Department of Soldiers Civil Re-establishment of Ottawa. The head of this branch for the Dominion is Mr. W. E. Segsworth, Administrator. This vocational branch is charged with the responsibilities in connexion with all the special training given to the returned men with a view to aiding them to return to the industries. It is an industrial proposition rather than an educational one. It is not because I am a professor that I hold this position, but rather because for twenty years I was intimately connected with industries as a mining engineer before I became a professor. The work of this branch commences with the man at the earliest possible moment after his return to the hospitals in Canada and continues with him until months after he is placed in the industry. We begin our work at the bedside with what is known as "bedside or ward occupations", such as basket-making, sketching, needlework or other diversional occupations. We continue in the hospital in what, amongst other names, are called curative workshops. We continue after the discharge from hospital in a variety of ways, giving those

men whose disabilities are such that they cannot return to their previous occupation, special training courses averaging about six months with pay and allowances. For these training courses we have enlisted many agencies—the technical schools, the universities, the industries themselves, and also not a few special classes of our own organization. The problem is a large one. Being without precedent, we have to feel our way, which means making mistakes and profiting thereby, as well as making direct progress. As some illustration of the size of this work in Ontario alone, I may say that my head office in Toronto has a staff of over sixty-five engaged in studying and organizing, and this staff is growing rapidly.

If I can hold your attention any longer there is one idea that I would like to bring forward. You will note that the vocational branch provides, and maintains jurisdiction over, the personnel and the equipment for the ward occupations and curative workshops, that is, for the occupational therapy within the hospitals. On the face of it, it seems without possibility of supporting argument, that non-medical men should attempt to play any such part within a hospital, and I am quite prepared to argue against it and if winning were to be by a show of hands, without doubt win practically unanimously in this assembly, but I would be arguing against my own convictions. After eight months of close intimacy with this branch I am convinced that this proposition of our maintaining this work in the hospitals is sane in theory and sound in practice. The time is not opportune for discussing this important phase of the subject, but the germ of the idea is something like this. You have just heard Colonel Russell draw a distinction between the malingerer and the psychopath. If you will allow me to mix your language with mine, let me suggest that all these returned men are industrial psychopaths. Even when made mentally and physically fit they are industrially unfit. These soldier patients in your hospitals need not only surgical and medical treatment but also some other treatment—perhaps Colonel Cameron with his happy command of the classics will be good enough to coin a word or phrase. Meanwhile the engineers, the professional men of the industries, are tackling the work under a variety of names. As far as it has gone, it has worked comfortably and we have received most gratifying support from the medical men. My attitude towards my staff in this work is something like this: "The work of the hospitals is curative; the doctor is absolutely dominant; you have no enforceable rights and no privileges other than that of being present. You are guests in another man's house. So long as you behave your-

selves as becomes a guest you will receive all the gracious courtesies of a pleasant host. Your function is to coöperate so smoothly that it is a blending rather than a coöperation." And, Sir, that is the way it has worked out and is working out. My staff is made up largely of engineers—professional men. They are not all engineers, but nearly all the principal men are engineers or architects. They are the professional men of the industries, and as professional men they can coöperate with their brother professional men—the doctors—in service to the community.

A new psychopathic Institute is to be erected in Winnipeg. The General Hospital finance committee held a meeting to award the tender for its construction. It will be used for the care and cure of soldiers of the province who return from the war suffering from mental diseases. Two years ago the provincial government voted $50,000 for the purpose of establishing this institution, but the superintendent of the hospital and the architect affirm a sum exceeding this amount will be required. It is understood the provincial government will meet the added cost by means of a special vote next session.

THE PRESENT POSITION OF VACCINE THERAPY

By William Boyd, M.D., M.R.C.P.

Professor of Pathology, University of Manitoba

IN the history of scientific thought, and especially in the history of medical thought, no phenomenon is so common as that of the pendulum. There is the forward swing, usually excessive, and there is the backward swing, even more excessive. In every case truth will be found to lie bewteen the two extremes, but nothing is more difficult than to realize this while either swing is in progress.

Innumerable instances of this truth suggest themselves. At any given time there is always one favourite operation with the surgeon. As the White Queen in Alice in Wonderland, when in doubt as how to act, used to exclaim. "Off with his head," so the surgeon of to-day says "off with his appendix" or "out with his tonsils", and soon it may be "out with his spleen". So also the physician of to-day when in similar doubt cries "In with a vaccine!" It may not be amiss, therefore, to consider the present position of vaccine therapy, to dwell upon its very great uses, and to guard against the abuse which invariably tends to become associated with a potent remedy.

For the pendulum of vaccine treatment is about the height of its swing, and indications are not lacking that it may soon commence its backward journey.

The principle of vaccine therapy is the determination to the affected part of antibacterial bodies—lysins, opsonins, agglutinins, and so forth—these antibodies being produced by the injection into healthy tissue of the germs which are the *casual* agent of the disease. It is obvious, therefore, that the very first step is to determine accurately the nature of the causal organism.

Although this identification of the causal organism is essentially a laboratory procedure, the active coöperation of the physi-

Read at the annual meeting of the Saskatchewan Medical Association, July, 1917.
Received for publication, October 25th, 1917.

cian is absolutely necessary. Unless the specimen is collected with due precautions, it is not worth while considering the treatment of the case with vaccines.

Let us take the case of a patient suffering from repeated attacks of bronchitis. Such a patient may derive enormous benefit from the proper use of a vaccine. But if the sputum be collected in a casual manner, the real cause of the condition may be entirely missed. The patient may have a constantly recurring infection in his bronchial tubes with the pneumococcus, or the influenza bacillus. In passing through a mouth teeming with organisms the sputum may become heavily infected with an organism which may completely outgrow the delicate influenza bacillus. By adopting suitable measures, however, the careful physician can to a great extent eliminate this source of error.

Again, in collecting specimens from the interior of the nose, unless the swab be taken through a sterile nasal speculum, culture may show nothing but a growth of staphylococci collected from the hairs guarding the anterior nares. The same applies, but with even greater force, to specimens taken from the interior of the uterus in cases of puerperal septicæmia.

This point may appear too obvious to be dwelt upon, but in actual practice one finds that it is largely disregarded. In hospital work such specimens should be taken by the house surgeon, and not left in the hands of a nurse. I have actually had a swab of vaginal discharge sent in from a case of puerperal septicæmia with a request that a vaccine be prepared. Such carelessness can only serve to bring the whole method of vaccine therapy into disrepute.

But even when the specimen has been collected with the most careful technic, it may be no easy matter to separate out the causal organism. Hæmophilic organisms such as the influenza bacillus may require to be planted out on special blood-containing media, as they may not grow on the ordinary laboratory media. It is always desirable, therefore, to give the bacteriologist some indication as to the nature of the case, so that he may have some chance of starting his work on right lines.

Again it may be very difficult to separate out the organism even when we know that it is present. Films made from the urine of a case of cystitis may show a mixture of B. coli and a streptococcus, but in culture the coli organisms may grow so luxuriantly that the streptococcus simply cannot be isolated. And yet to treat the patient with a coli vaccine and ignore the streptococcus would be, to say the least, unsatisfactory. In such cases we may

succeed by some such device as adding an anti-coli serum to the culture medium, thus inhibiting the growth of the B. coli, and giving the streptococcus the chance to develop. A combined vaccine can then be prepared, and treatment instituted with a fair chance of success.

Having determined the causal organism, we must decide whether to use a stock or an autogenous vaccine. The question of the choice of the vaccine should lie with the bacteriologist. Everything depends upon the nature of the bacteria which he finds. Most cases of infection with the staphylococcus, and especially localized skin infections, do as well with a stock as with an autogenous vaccine. Indeed it is not uncommon to find that a case which has made little progress with an autogenous staphylococcal vaccine rapidly clears up when a stock one is used which has been prepared from a number of sources. Such being the case, it is only throwing undue work on the pathologist and expense on the patient to ask for an autogenous vaccine in every case of infection with the staphylococcus.

Other conditions in which a stock vaccine is preferable to an autogenous are infections by the acne bacillus and the gonococcus. Both of these organisms can only be grown with very considerable difficulty.

Autogenous vaccines, on the other hand, should be used in infections from streptococci, pneumococci, and B. coli. An exception may be made in the case of erysipelas, in which a stock polyvalent streptococcal vaccine sometimes gives good results.

The vaccine being prepared, its administration must next be considered. A vaccine is best injected into the subcutaneous tissue. Observations on the opsonic index indicate that a greater rise of the index occurs when this method is used than by the intramuscular or intravenous method. It is true that intravenous injections are coming into fashion, notably in the treatment of typhoid fever and of pneumonia, but the mechanism here is probably very different to that in the case of ordinary vaccine treatment, and will be considered later.

The method of treatment offers another instance of how the physician and the bacteriologist must work in conjunction. Merely to inject a vaccine once a week or so is in many cases to fall far short of one's duty to the patient, and certainly is not giving the method a fair trial. After all, vaccine therapy is not a sort of magician's wand by means of which we can exorcise every variety of

disease. It is merely one of the means at the disposal of the physician, and to exalt it unduly at the expense of the other well-tried methods is pernicious in the extreme. The man who tries to treat a case of pyorrhœa alveolaris with vaccines *alone* shows that he has no grasp of the principles of treatment. Again a chronic abscess cavity or sinus is often lined by a layer of coagulated lymph, which will effectually bar the way to any antibodies which may be present in the blood. Until the conditions have been altered by scraping the walls of the cavity, by the local application of 0·5 per cent. sodium citrate solution to prevent further coagulation and hypertonic saline solution to promote an outward flow of serum, and by the use of warmth, hot fomentations, etc., to produce hyperæmia of the part, it is futile to think of vaccine therapy. No doubt the reason why simple lumbar puncture is the most effective of all means of treating acute meningitis is that the withdrawal of the fluid by lowering the pressure enables the immune bodies in the serum to reach the field of battle.

Having now considered the general principles of the method, we may briefly consider its application in the case of some of the common diseases.

It is unnecessary to say anything in connexion with the use of vaccines in staphylococcal infections, except to recall the value of the stock vaccine. To see a long standing case of boils clear up under the use of vaccine is one of the delights of medicine, and when the patient has recovered he has the satisfaction of knowing that he is immune from his trouble for at least some time to come.

It is preëminently in localized staphylococcal conditions that the stock vaccine is so useful. If the infection becomes generalized, as in many surgical conditions, better results will be obtained with an autogenous vaccine. In such general infections the initial dose should be considerably smaller.

Another condition in which stock vaccines are commonly employed is gonorrhœal arthritis, and certainly in many cases the course of this intractable disease is shortened by vaccine treatment. In order to be certain that the gonococcus is the offending organism, the joint may be punctured and the fluid examined. Or a diagnostic injection of five hundred million gonococci may be given, and the patient's temperature taken every four hours. A rise of temperature of 1·5° or 2° with malaise and joint pains is taken to indicate a positive reaction. All our ideas regarding the importance of specificity, however, have lately been receiving rude jars, and it is now the

fashion to treat gonorrhœal arthritis with intravenous injections of some foreign protein, a stock typhoid vaccine being often employed for this purpose.

One of the diseases in which vaccines may prove most useful is chronic bronchitis. It is a condition which calls forth all the skill of the bacteriologist, for the germs which may cause it are numerous, and some of them are by no means easy to grow in numbers sufficient to provide material for a vaccine. In the first place it is essential that every care be used in the collection of the specimen of sputum. The teeth should be well cleaned with a hard new brush and water which has been boiled. No antiseptics must be used. The mouth and throat are to be thoroughly rinsed out with sterile water. Finally a small quantity of sputum is coughed up into a wide-necked sterile bottle. The specimen, especially in warm weather, should be examined as soon as possible, otherwise a very erroneous impression of the bacterial flora may be received. It is always wise to make smears on slides from the sputum while it is yet fresh. Finally, the bacteriologist on receiving the sputum must always plant it out on a medium containing hæmoglobin.

If all these precautions be taken, accurate information regarding the infecting organism will be obtained. The most frequent offenders are the streptococcus, the pneumococcus, Friedländer's bacillus, and the influenza bacillus. The predominant organism varies in a community from year to year—sometimes the pneumococcus, sometimes the influenza bacillus, sometimes a mixture of the two.

A vaccine is prepared from one or more of the germs present, when the time comes for it to be administered. Wright, in his early work on vaccines, used to lay great stress on the negative phase which observations on the opsonic index showed to follow an injection of vaccine. We now know that for practical purposes the negative phase may be disregarded in the majority of infections. Bronchitis, however, offers an exception. The negative phase is a real danger, for during it the patient is in a hypersensitive condition, and if he goes out into a cold wind or a heated public hall, his last state may be worse than his first. It is wise, therefore, to inject the vaccine early in the evening, and forbid the patient to go out till next morning, by which time the negative phase will have passed.

It is a universal rule in vaccine work that unless a vaccine produces a reaction, either the vaccine is useless or the dosage is inadequate. The reaction, in addition to the local one at the site

of injection, may be general or focal. The general reaction manifests itself by such symptoms as headache, malaise, and sleepiness, the focal by an increase in the physical signs at the site of infection. With the exception of hay fever, there is perhaps no condition in which we can so accurately watch the focal reaction as bronchitis. Before the injection is given, the amount of the twenty-four hours' sputum is measured, the temperature taken, and a careful chart made of the physical signs over the lungs. The day after the inoculation the temperature is again taken and the physical signs charted. By comparing the two charts it can at once be seen if there has been any exacerbation of the condition. This is a most scientific and accurate method of controlling the use of vaccines. By means of it we can determine whether we are employing the right organism, and whether the dose is suitable. Such observations prove that, whatever be the fashionable view at the present moment, specificity is of real importance in vaccine work. Suppose that a patient has a pneumococcal infection of the bronchi. The sputum, while being coughed up, may pick up the micrococcus catarrhalis from the nasopharynx. If a vaccine be made from the latter organism, no reaction will be produced in the lungs by even large doses. But if even twenty-five million pneumococci be injected, there will be a rise of temperature, marked increase in the amount of sputum, and great extension of the area of râles. Surely this response is specific in the strictest sense.

When the correct vaccine has been prepared and administered in the correct dosage, the results obtained in chronic bronchitis are generally gratifying, and sometimes brilliant. The sputum may diminish to a tenth of the amount, the cough largely disappear, and the general physique of the patient improve out of all recognition. I remember a striking case which I had under observation during the winter of 1913. The patient was a splendidly made man of forty-five, who had been through the Boer war without a day's illness. On returning to England, however, he developed very severe bronchitis, and since that time, that is to say for eleven years, his life was made a misery to him every winter by recurring attacks of bronchitis of great severity. He was almost always confined to the house for several weeks, and often had to stay in bed. He had lost between thirty and forty pounds in weight, and was very depressed, for he had consulted innumerable doctors, and had tried every conceivable method of treatment. All had been of no avail, and he saw no prospect of ever getting rid of his distressing malady.

I collected his sputum with the precautions already described, and took swabs from the nasal mucosa and the nasopharynx, planting them out on plates of blood-agar. From all of these sources I got a plentiful growth of the pneumococcus. An autogenous vaccine was prepared, and an initial dose of ten millons was injected. A most violent reaction followed, both general and focal, There was a rise of temperature of a couple of degrees, great malaise, and focal disturbance along the whole respiratory tract. There was a great increase in the moist sounds all over the chest, the sputum became copious, and watery, as did the nasal secretion, and there were signs of marked congestion of the frontal sinuses. When this reaction had passed off I diminished the dose considerably, and it now only produced a slight focal reaction in the lungs and the nasal mucous membrane. Although it is desirable to produce some focal reaction, it should be made the rule never to increase the dose until reaction is no longer produced. After a few months of treatment the patient became a new man. He put on flesh, quite recovered his buoyancy of spirits, the sputum greatly decreased in amount, and the local signs almost entirely disappeared. The final result was that for the first time for eleven years the patient was not confined to the house for a day during the whole winter, and at the end he was indeed a new man both physically and mentally. I have described this case in detail to show what can be done in a disease notoriously difficult to treat by the careful and scientific use of vaccines.

Advocates may be found for the use of vaccines in acute inflammatory conditions of the lungs, and especially of acute lobar pneumonia. I must confess to feeling very sceptical regarding the claims that are sometimes made in this connexion. Owing to the massive exudate in the alveoli, and the emptying of the pulmonary capillaries, it is impossible for antibodies, no matter how numerous, to reach the seat of infection. The use of vaccines in this condition is not only thoroughly unscientific, but is not justified by empirical results. The mortality of pneumonia has certainly not been lowered by vaccine treatment, although some of its adovcates claim that the crisis is slightly hastened.

A very different infection of the respiratory tract, but one in which vaccine treatment is well worth a trial, is ozæna or atrophic rhinitis. There is still some doubt regarding the causal organism, but the B. ozænæ fœtidus is so constantly present on the nasal mucosa that it is almost certain that it bears some relationship to the condition. I have lately been observing a patient suffering from

this condition, a boy of sixteen. Each time the nose was examined this bacillus was obtained in pure culture, and the cultures possessed an odour identical with that from the nose. After the sixth injection the boy had a somewhat violent reaction, and in a few days the odour had almost entirely disappeared. The father declared that it was 90 per cent. better. Sufficient time has not yet elapsed to allow one to say whether or not the improvement will be permanent, but the method is well worthy of trial in a condition in which all other lines of treatment are of so little avail.

Of the vaccine treatment of whooping cough I have no personal experience, but both the prophylactic and the therapeutic results appear to justify its use, although opinion on the subject is by no means unanimous.

There are multitudes of other conditions which have been treated by vaccines with greater or less justification, but it is impossible to touch upon them in even the briefest manner.

Before, however, leaving the subject of treatment and passing to that of prevention, we may consider for a moment the question of the vaccine treatment of the carriers of disease, and especially of typhoid carriers. To clear typhoid bacilli out of a carrier in whom they have firmly established themselves is a truly herculean task, a veritable cleansing of the Augean stables. Drugs and antiseptics may as well be poured down the sink. Under these circumstances vaccine treatment may be tried. In many instances it will fail, but cases have been described in which the bacilli completely disappeared from the urine, after having been constantly present for a number of years. An ingenious method may here be referred to which has lately been introduced for the purpose of readily isolating typhoid bacilli from a carrier. The great difficulty in isolating the bacilli, especially in the case of a fæcal carrier, is the very large numbers of other organisms present in the lower bowel. The duodenum, on the other hand, is almost free from bacteria, but if the gall bladder harbours typhoid bacilli the duodenum may contain what is practically a pure culture of them. By lowering an Einhorn's duodenal tube into the duodenum, and thus gaining access to the contents of the gall bladder, many carriers may be detected who would otherwise be passed over. The Germans have found the typhoid carrier a thorny problem. They have even proposed forming a battalion of such carriers. This battalion might no doubt have been left behind in the great retreat with excellent results!

Let us now leave the question of treatment and turn to the

prophylactic use of vaccines. And here we are on much firmer ground. Whatever may be thought about the vaccine treatment of a disease which is in mid-course, it is universally admitted that no more potent and scientific method of prevention, short of removal of the cause, of infectious disease exists than the prophylactic use of vaccines. I have once or twice referred to the question of specificity. Whatever doubts may be cast by modern workers on the importance of specificity, none can be entertained on its being all important in prophylaxis. Inoculation with B. typhosus will not afford protection against B. paratyphosus A. or B That is to say, the specfictry of the protection is most sharply defined. This may be demonstrated in a striking manner by estimating the titre of the agglutinus present after a prophylactic injection. If a vaccine of paratyphoid B. be used, the patient's serum will agglutinate that bacillus in a dilution of perhaps one in five hundred, whereas the typhoid and paratyphoid A bacilli will either not be agglutinated at all or only in such low dilutions as one in ten or one in twenty.

All doubts regarding the value of prophylactic inoculation have been settled once for all by the gigantic experiment provided by war conditions. Wherever a few thousand men are gathered together under unhygienic conditions the menace of typhoid must be faced. In the Spanish-American war, out of 100,000 American troops, 20,000 developed typhoid. In the Boer war there were 57,000 cases of typhoid with 8,000 deaths—the same number that died from wounds. In the present war the death rate from typhoid amongst *inoculated* British troops on the Western front is lower than the death rate amongst civilians in England during the same period. Lest it be urged that improved sanitation and other similar measures are responsible for this truly wonderful result, we have a control in the small body of uninoculated men. I cannot give the exact figures for these, but the difference between the two both in case incidence and in mortality is most remarkable. The prophylactic work on plague and cholera is also well known.

It is, however, hardly realized how much may be done to prevent recurring attacks of some of the common diseases of civil life. Of course in this work it is essential that we be certain of the exact infection from which the patient is liable to suffer. An excellent case in point is hay fever. If grass pollen be the disturbing factor, the patient may be immunized against it during the winter months, with the result that when summer comes he can face his old foe with impunity. And in the case of hay fever we can determine with exactness the nature of the infection by employing the

skin reaction. Further, by determining the exact dilution with which the reaction is obtained, we have a sure indication as to the correct dose with which to commence treatment. One patient whom I treated in this way used to have attacks similar to hay fever if too large a dose were used, but when summer came he found to his delight that he could live in the country without life being a misery to him. In this country, however, where there is a variety of irritants, such as the ragwort, golden rod, etc., special care must be taken that the patient is immunized against the real cause.

Another sphere where prophylactic inoculation often proves of great value is in recurring infections of the respiratory tract. Some people get colds in the head every winter which they have great difficulty in shaking off. Others suffer from bronchial attacks which may confine them to the house for weeks, more especially in the case of elderly people whose mitral valve is not as competent as it should be. In such patients the infection is often due to the same organism year after year, the micrococcus catarrhalis, perhaps, in the nose, the pneumococcus in the chest. These patients are hypersensitive to some special organism, and if they can be rendered immune to it by three or four injections in the fall, the results may be most gratifying to the patient. Here again, of course, accurate bacteriological diagnosis is a *sine qua non*.

During the course of this paper reference has been made on several occasions to the question of specificity. When Sir Almroth Wright in 1902 introduced the use of vaccines for curative purposes, he based his work on the assumption that the injection of a dead culture of bacteria provoked a specific reaction with the production of a specific antibody. Within the last two or three years considerable doubt has been cast on the importance of the specific element by a number of observers. This doubt first originated with the work of the intravenous injection of typhoid vaccines in the treatment of typhoid fever. It was in 1912 that Ichikawa first used the intravenous route, and he was followed by a number of workers, notably Gay and Chickering in the United States. The essential feature of the method is to produce a marked reaction characterized by a chill, often severe in character, a rapid rise of temperature, and a marked leucocytosis. In successful cases these phenomena soon disappear, and the disease terminates by crisis. In a series of fifty-three cases of typhoid fever, Gay and Chickering succeeded in producing cure by crisis in 41·5 per cent., a truly remarkable result when the ordinary course of the disease is considered. Very shortly

it was found that it was quite unnecessary to use the specific typhoid vaccine in order to produce the reaction. Any vaccine would apparently do as well, and even albumose gave good results. And now it is being shouted from the house-tops that specificity is a myth, and specific therapy a snare and a delusion, that it does not matter much what you inject into a patient as long as it contains a protein, and that to insist on the importance of determining the causal organism is to declare oneself an out-of-date pedant. When we can treat typhoid with a meningococcus vaccine and pneumonia with a typhoid vaccine, why trouble about such small trifles as bacteriological diagnosis? There is only one thing to be said in reply. The history of medicine is one great cemetery of opinions which have been hastily adopted and as hastily abandoned. The medical profession has ever shown a remarkable lack of the critical faculty, which is so essential in all scientific work. Like the Athenians it has always been eager to hear some new thing. There are no doubt great possibilities in front of the intravenous method, but to my mind the facts so far discovered in no way invalidate the specific principle in vaccine therapy. The reaction produced by an intravenous injection is entirely different to that following a subcutaneous one. The former reaction in its severity and its rapidity of onset is much more allied to an anaphylactic phenomenon, which may leave the body in a state of antianaphylaxis in which it is immune to the action of the bacilli. At the same time one must admit that it is probable that the specific element is of considerably greater importance in prophylactic than in curative work. Further than that I am not prepared to go.

Vaccines, like other good things, may be abused as well as used. Wright introduced his method as a strictly scientific one, to be controlled by the use of the opsonic index. The method was adopted generally, the control was dropped, vaccines were used for any and every condition, and finally the manufacturer took the matter into his own hands, and proceeded to treat the profession to a positive diarrhœa vaccinorum, and not only of vaccines, but of various semi-secret, concentrated preparations of toxins in the shape of phylacogens and its congeners, till all that the physician had to do was to make a clinical diagnosis and the vaccine arrived by return of post. All that is surely abuse of a valuable method. The successful and scientific use of vaccines necessitates close co-operation between the physician and the bacteriologist. The latter should be in possession of the clinical facts of the case. The specimen must be taken with due bacteriological precautions, and by one skilled in such work.

In every case a bacteriological diagnosis must be made before a stock vaccine is employed. To do otherwise is as reasonable as to saturate a patient with quinine without looking for the malaria parasite in the blood, or to start out on a course of treatment with salvarsan without first performing the Wassermann test. Finally, the dosage must be guided by close observations on the focal reaction, and a keen watch kept on the bacteriological progress of the disease. Only thus can we do justice to a method which is one of the most scientific and valuable in the whole range of therapeutics.

A RECENT endowment to the University of Toronto by a prominent citizen provides a sum sufficient to establish four special chairs in the faculty of medicine, and may range anywhere between half a million to three million dollars. The chairs are to be held by specially qualified men who are to devote their whole time to the work. One chair in pediatrics, for the special study of children's diseases; a second chair in gynæcology, for advance work in reference to the surgical diseases of women; a third, probably for orthopædic work, and a fourth in some special branch of medicine.

SOME OBSERVATIONS IN RESPECT TO PUBLIC HEALTH

By T. J. Norman

Provincial Health Officer, Alberta

IN presenting this short address under the above title, I do so with the desire of developing some points that may well be beneficially discussed, in the hope of bringing out expressions of ideas and opinions that would be helpful, not only to the provincial board and other health boards, but also to the medical practitioner and others more or less intimately connected with health work; for I recognize that the full-time health officer and the part-time health officer have the same difficulty to contend with as the Provincial Board of Health, only that naturally their work is more local, and not so diffuse as that attendant upon the provincial board.

If one addressed himself to a gathering wholly of the laity and asked what were Alberta's most valuable assets, many would probably answer at once, "Our wonderful and peerless agricultural lands fitted for the production of all kinds of grain, stock, and vegetable products." Others might say, "Our great storage vaults of coal," for 14½ per cent. of all the coal in the world is estimated to be in Alberta. Others again would refer to the timber and fisheries; while those of a poetic and æsthetic mind would lay stress on the wealth of beauty depicted in those wonder spots in the mountains—Banff, Laggan, etc., and the splendid natural floral beauty of the prairie. These truly are most wonderful assets, but, after all, are they our greatest? I think not; and careful thought will discover to us that our really greatest asset is not included in these above mentioned; but that the really greatest asset is our men, our women, our boys and our girls. For what would these wonderful first mentioned assets mean unless man investigated, exploited and made them productive; So we must place man as the province's greatest asset. Ruskin says, "There is no wealth but life. That country is the richest that nourishes the greatest number of noble and happy human beings."

But man, in a sense, is only a machine, and a machine to be

highly efficient must be perfect in every detail, and so a man to be at the highest stage of efficiency must be perfect, and that means perfect health; but to my mind, to be what one would term ideally so, we must have not only perfect physical health, but a perfect mental and moral balance as well; for physical and mental and moral health, it seems to me, are not only closely intertwined the one with the other, but are all more or less associated with the workings of all public health departments; for when we think of all the physical, mental and moral suffering so often connected with such diseases as syphilis, tuberculosis, etc., it behooves us to put forth every effort for the preservation at its highest efficiency that noblest and best of all our assets.

But are we doing this efficiently (for it is only as we attain one height that we behold great heights beyond), and if not, how far are we falling short, and why are we falling short? These are serious questions to be asked and answered; for it seems to me there is no doubt but that we are falling short. Evolution is the order of the day, and evolution means, or at least should mean, progress, and we should get a proper perspective and clear vision of the good which the future ought to bring; for the future generation to whom will fall the task of further advancements, summon each one of us to be true to the trust committed to him to-day, and mark all possible progress, and this in both an individual and collective sense.

It is said that every child has the right to be born well, and surely this ought to be so, when we consider that every child is brought into the world without any volition on its part and without any say in the matter. But with what a disastrous heritage some of them are endowed! and what with syphilis, tuberculosis, epilepsy, and feeblemindedness in the family tree, the outlook for the babe, although it may be unconscious of it, is oft-times appalling, and the fair human monument may even at birth show the despoilment of the sins of the father or mother or both; and all through life, that human body is exposed on every hand, through disease, to disfigurement, impaired vitality, or death, much of which, if it were not for apathy, carelessness or ignorance, could be avoided, and so here again, much of this disaster and suffering is caused by actions in which the child has no part; such as ignorant or wilful exposure to infectious diseases, the use of impure food, water, milk, etc.

Then what of the home and the home's environment! It seems to me there is so much truth in what that great lover of nature, that loving, kindly soul—John Burroughs, the naturalist—has

said, that the following quotation from one of his books would not be amiss:

"Man loved the beautiful, the artistic, the ornamental, long before he loved the true and the just; he was proud before he was kind; he was chivalrous before he was decent; he was tattooed before he was washed; he built temples and cathedrals before he built a home; he sacrificed to his gods before he helped his neighbour; he was heroic before he was self-denying; he was devout before he was charitable."

Then the author goes on to say that we are to-day growing into the humanities, and we realize this is true, as we think of the various charities and charitable institutions. But are these charities always instituted and conducted out of love for our brother and mankind, or are they rather not used as a kind of salve for the conscience and merely as a recognized duty? But be that as it may, the principle is for good, and although Burroughs uses the past tense, we think it could be applied to-day, for really do we not pay much more attention to our parliament buildings, our churches, cathedrals and other various public buildings, than we do to the wretched back street home into which is ushered a life that will help either to make or mar the world into which it is born.

It seems to me we go about many things the wrong end first. We are constantly dipping out the muddy water instead of going back to the main or side streams that are contaminating the life, and shutting them off, or purifying them at the fountain head. The same thing applies in respect to infectious diseases. Take for instance, tuberculosis. We provide, it may be, sanitoria for some of these cases, whether advanced or incipient, but what are we doing to eliminate tuberculous milk by eliminating the tubercular cow; or what are we doing to protect the home where the tubercular patient may still be, or investigating as to whether others have been infected; or instructing in respect to prevention of further contagion, and seeing that those instructions are carried out.

It has recently been estimated that if all the tubercular patients in the United States, whether advanced or incipient, were placed in institutions, that the said institutions would not hold much over 10 per cent. of them, and if we had a provincial institution, doubtless the same percentage would hold good here. The same specialist made the statement that he considered careful home treatment productive of practically the same immediate and ultimate results as institutional treatment, and less costly to the patient and community.

Then, too, the venereal diseases; for while their ravages may not be as yet so prominent in this young province, still we must not fail to recognize that they are with us; and so along the whole line of the communicable diseases, the feeble-minded, the slum home; we do not get after the original trouble as we should.

Why is not more being done, is a most natural and pertinent question, and one somewhat difficult to answer; for there is no doubt but that more should be done, and when the public mind gets out of its somnolent apathy, more will be done as a result of the general public demand. But it may be said, why wait for the public, when it is so well known what ought to be done? And then at once looms up in the highway of progress, that old spectre, lack of funds; and in these strenuous times, it looms bigger than ever. The local board and medical health officer of the village, town, and city, cannot work toward ideal conditions without money, and so the water purification system and sewage disposal system is left in abeyance, and it is difficult for the provincial board to unduly press for the construction of such in these strenuous times, and the municipal medical health officer, no matter how progressive his ideas may be, may be held blameable for lack of initiative and progressive work, when in reality the blame should not be placed at his door. It may be well for the medical health officers of these urban municipalities to remember that the difficulties that thus present themselves in local administration, are the same difficulties that present themselves to the provincial board, for the dealing with health matters efficiently, whether provincial or municipal, can only be done through the medium of men and money, and in these times both are hard to obtain. However, the scope of a short paper does not enable one to go into matters in detail, but I hope more points will be brought out during discussion.

The administration of the health act by the provincial board of health has many discouragements and annoyances, many of which should not be, and some at least of these annoyances are also in evidence in respect to all municipal medical health officers, as they can well testify, such as concealment of communicable diseases by householders (and I am almost afraid that possibly sometimes the concealment may be with the connivance of the physician); lack of reporting by doctors through carelessness or other reasons; breaking of quarantine; and ignorance of the health act and regulations; and I would like in conclusion to mention a few specific instances covering some of these features.

Doctors are often writing in for health acts, and these not

always the newer physicians, but the old-timers, and yet I understand that health acts were sent out to all doctors; but the act has been lost or misplaced. We are only too glad to send on the acts, but time has been lost in dealing with the case in the meantime, for it is generally on the outbreak of disease that the request is made, and in many cases it is the local board that the matter of quarantine, investigation, etc., should have been taken up with, and so things are in a confusion for a time; whereas if health acts were hung up and located as a calendar would be, it could be referred to in a minute, or if lost, a new one asked for at once.

Some few weeks ago we sent out to all doctors and secretaries of local boards, a synopsis of the health regulations, and requested them to hang them up for easy reference, and yet even since that we have had inquiries both by phone and letter from doctors and secretaries of local boards wanting information in respect to matters which this synopsis fully covers, and this surely indicates a lack of interest in these matters.

Some time ago a doctor both wrote and wired about the control of an epidemic, and as all the inspectors were out, it was a couple of days before one could be sent, and I happened to be the one to go, and yet when I arrived I found it a case in which the doctor, had he been familiar with the health act and regulations, would have had no need to have done all this wiring, as the case was fully covered with the health act, and I turned it up and showed it to him, and the blame for not taking action rested in this instance entirely with him, as he had both the power and the responsibility.

Another old practitioner in the province recently wrote in asking when measles was taken out of full quarantine and placed in modified quarantine, and why, if such was the case, had he not been sent the amendments, and if it was still full quarantine, why was the city of Edmonton privileged to have modified quarantine. I replied that if he would turn to a certain page of the health act, he would find that the health act and regulations of 1910 placed it on the modified quarantine list, and yet here was a doctor who had evidently for years been placing measles under full quarantine, due to unfamiliarity with the act.

Perhaps the disease that causes us the most annoyance because of non-reporting, is typhoid fever, and we are constantly finding out cases by accident, and I will enumerate a few instances.

While in a town last fall, I asked the health officer if the town had had any typhoid. "Yes," he said, "two cases." Neither had been reported, and he said one had not been reported to him by the attending physician, and the other he was not sure of at first.

In another town, a case sent to a hospital in a city was traced up and it was then discovered that there had been several cases in the town, and none reported.

In another town, the fact of several cases was discovered in exactly the same way, by tracing back from a city medical health officer's report.

One of our men was in another town on other matters, and again discovered accidentally that the town had typhoid; and the same thing happens in respect to other diseases. This laxity ought not to be.

Then again, we find that some places do not make full reports to the provincial board. On looking over the reports sent to us, and the medical health officers' reports to their council, and comparing, we find that often there is a discrepancy. For instance, a couple of years ago, one place reported to us some seventy cases of typhoid in the year, but the city's books showed one hundred. Vital statistics are only relative at the best, but unless we get relatively correct reports, they are really not of much value. In our bulletin we have tried to show the desirability and necessity of prompt and full reporting, and we have reason to believe that there is an improvement, but we find the smaller urban places, rural municipalities, and physicians with cases in local improvement districts, are yet in many cases lax in sending in reports, and being in ignorance of these centres of infection we cannot investigate them, and we find out in ways as above, or someone writes in asking why we are not looking after the epidemic, and, as you see, there is good reason why.

How are we to remedy the laxity in respect to reporting? Those failing to report render themselves liable to the penalty of the public health act, but imposed penalties do not always work out the right way, and we would far rather trust to the honour of the profession and their desire to help, for in most cases I believe it is not wilful, but due to carelessness; but it is most annoying, nevertheless, to be trying to trace up, say a case of typhoid, and in doing so sometimes stumble into a nest of unreported cases in another town.

Water analysis is another of the functions of the provincial board of health, and although done free and this fact given prominence in bulletins and pamphlets, still it is not taken advantage of as it should be. Hoping this somewhat disconnected paper may provide at least some food for thought, I leave the matter with you for discussion.

BLINDNESS OF THE NEWBORN—A PREVENTABLE DISEASE

By Gordon G. Copeland, B.A., M.B.

Assistant Obstetrical Surgeon, Toronto Western Hospital

MORE than 30 per cent. of the blind of this continent are sightless as a result of venereal disease. Nearly eighty per cent. of these blighted and cursed unfortunates are the result of gonorrheal ophthalmia neonatorum. or inflammation of the eyes of new born babies due to clap or gonorrhœa. Primarily the parents of these children are responsible, the father usually actively and immorally so. The social evil, the sins of the fathers, are visited on the innocent and helpless infants.

This is a supposedly civilized country and our medical profession progressive. Is it really so? The hapless inmates of our asylums for the blind and the scores scattered among their own homes, a burden and problem to themselves and society, these blind are in their eternal night largely because the doctors, nurses, midwives, or others in attendance at the birth of these individuals failed to use effective precautions to prevent the disease developing, or treating it adequately when it started. I do not refer to those who have been called into a case in an emergency and have done the best they could, but to those doctors or nurses who habitually neglect to take proper precautions. Blindness caused by gonorrhœal infection at birth can be prevented in 95 per cent. of cases for less than five cents in money and five minutes in time on the part of the attendant. When the provincial boards of health do their plain duty, prophylactic outfits will be furnished free of charge.

Through the courtesy of Mr. C. W. James, principal of the Ontario School for the Blind at Brantford, and Dr. B. C. Bell, ophthalmologist, both of whom I wish to thank, I have received the latest statistics representative of Ontario, and therefore probably true also for the other provinces of Canada. The four questions I asked and their answers are as follows:

Read before the Canadian Medical Association in Montreal, June, 1917.

Question 1. What proportion of your students are blind from the effects of venereal disease? Answer. 33·5 per cent.

Question 2. What proportion are blind due to gonorrhœa? Answer. 22·6 per cent.

Question 3. What proportion are blind as a result of venereal disease present at, or contracted at birth? Answer. 23·3 per cent.

Question 4. What proportion are blind from the effects of ophthalmia neonatorum? Answer. 22·6 per cent.

All cases of ophthalmia neonatorum were considered gonorrhœal. A small number were blind at birth from interstitial keratitis and optic atrophy.

Ignorance, carelessness, irresponsibility, criminal negligence, have all too frequently stained the fair name of the healing profession. Through these vices, the nursing and medical professions have been the proximate cause why many children have needlessly gone blind when prompt and effective measures would have prevented nearly all cases from developing.

Do our doctors and nurses not know that gonococci, harboured in the genital tract of the mother, infect the eyes of the newborn babe and cause a disease which in most cases results in blindness if not treated effectively? They do! Do these practitioners not know that there are efficient, cheap and available antiseptics which, if promptly and correctly instilled into the eyes of babies from infected mothers, will surely prevent the growth of the infecting organisms? They do! If they do not know these generally known facts, they are not fit to practice their professions. But if they do know these truths and do not practice the recognized prophylactic methods against this terrible incapacitating disease, they are criminally negligent. But they say in protest, "the parents of the child were nice people and I never suspected any venereal trouble." Just so. Does that bring back the lost sight? The bloody fields of Europe were fair to look upon, yet they contained the deadly germs of tetanus. To-day the wounded are given several prophylactic injections of anti-tetanic serum because tetanus may develop otherwise. It is not feasible, and is often impossible to determine whether the gonococcus inhabits the birth canal of the majority of our patients unless there are active signs of the disease present. Often the baby is born before the arrival of the doctor, who may never have seen the patient before. Can nothing be done? Are we to take a chance that the baby will not become infected? Remember that the one case in a thousand means several thousand or

more in the seven or more millions of Canadian people. Out of that several thousand babies with sore eyes, several hundred are sure to go blind. As a people we are suffering and shall suffer great loss due to the unpreventable wastage of war. Let us stop needless and avoidable disabilities such as blindness of the newborn. There is only one way practicable: UNIVERSAL PROPHYLAXIS.

Compel every medical practitioner, nurse, midwife, or person in attendance at a confinement to use an effective antiseptic promptly and properly, instilling it into the eyes of the newborn babe. Yes! Even in the most apparently saintly family, for this desirable mental condition may be acquired after the clap of doom has made them think. You know as well as I do, that a very large proportion of the adult male population, especially of our cities, have had venereal disease. Probably I state the conditions conservatively when I say that over half the male population of military age have had gonorrhea. If your patients object that this procedure reflects on their character you can say truthfully that there are organisms other than the gonococcus which can cause babies' sore eyes and will lead to blindness. Let it hurt their feelings if unavoidable, but save the eyesight of the babies. In my own practice, I put several drops of freshly made 25 per cent. argyrol into the eyes of every baby. All my private cases get this treatment. Just put a two grain tabloid (B. W. & Co.) of argyrol in a sterile graduate and add eight drops of sterile water making a fresh 25 per cent. solution. I never ask the parents and rarely discuss it with them, considering this duty as much a part of good obstetrics as boiling up my gloves and instruments. To fail to give the baby adequate and well-known preventive measures against disease to the full extent of our knowledge and ability is malpraxis.

Ontario is at last making a move in the right direction. Dr. McCullough, chief officer of health for Ontario, writes me in part as follows in reply to my question as to the attitude of his department on this important matter: "If I had my way about it, I should have everyone concerned with a confinement report sore eyes occurring during the first two weeks, to use prophylactic treatment under penalty, the prophylactic outfit to be supplied free by the provincial board. The provincial board feels that we should have such legislation and will do what they can to obtain it." This progressive attitude deserves generous support. Bulletin 49, of the United States Public Health Service, prepared by Assistant Surgeon General Kerr and very kindly sent to me by him and specially marked is most instructive in following the progressive laws dealing

with this subject. I shall only give the gist of a few of the more important laws. On the birth certificates used in the states of Indiana, North Dakota, Minnesota, and Ohio there are clauses reading: "Were precautions taken against ophthalmia neonatorum?" In New York State the special clause reads: "What preventive for ophthalmia neonatorum did you use? If none, state reason therefor." Failure to answer these questions renders it unlawful to try to collect by process of law, bills or charges for professional services in connection with the case. When no physician is in attendance on the case, the health authorities must furnish remedial treatment. Several states furnish prophylactic outfits, consisting generally of 1 per cent. silver nitrate in an ampule, a sterile dropper and instructions. The laws on this question are notably good in Indiana, North Dakota, Porto Rico, Utah, and Illinois.

Utah: Acts of 1911, ch. 30.

Sec. 1.—"It shall be the duty of every physician and every midwife attending a case of childbirth, to report to the local board of health every case where the new-born child has inflammation of the eyes, attended by a discharge therefrom. Such report to be made within six hours after the appearance of such disease. It shall be the duty of such physician or midwife to treat the eyes of the child so afflicted in accordance with the rules of the state board of health. Every physician or midwife failing to comply with the provisions of this act shall be guilty of a misdemeanor."

(Rules: State Board of Health)

Rule No. 1. No midwife shall treat any case of ophthalmia neonatorum, or inflammation of the eyes of the newly-born infant, unless it is impossible to secure the services of a physician, provided that in case the services of a physician shall be secured, a midwife may begin and carry out treatment until his arrival.

Rule No. 2. In the event that the services of a physician cannot be secured, midwives are authorized to use and apply the following treatment: Immediately upon the discovery in a newly-born infant of an inflammation of the eyes, attended by a mattery discharge therefrom, five drops of a 20 per cent. solution of argyrol shall be dropped into the eyes with an eye dropper, after having separated the lids with the finger and thumb, and this treatment shall be repeated every hour for four days, and longer if a discharge is still present. After four days, if the discharge has ceased, the treatment may be reduced in frequency to intervals of four times daily for several days, until it is shewn that the discharge is not liable to return.

Before each application of the argyrol solution, the eyes should be thoroughly irrigated, and cleansed by dropping or pouring into them a 1 per cent. solution of sodium chloride (common salt) or a satured solution of boric acid. For practical purposes, the salt solution may be prepared by dissolving one teaspoonful of salt in a pint of water.

Note—The person treating the eyes should exercise the utmose care to avoid touching the cornea (eyeball), as there is danger of causing serious injury thereby. In applying the treatment, the child should be placed flat on its back, and the head so held that the solution will not quickly escape from the eyes.

Inasmuch as the secretions from the eyes are very infectious, care should be taken to destroy all articles contaminated by them, and to sterilize the hands after each treatment.

The treatment above described is considered by eminent authorities to be entirely

effective and safer than solutions of silver nitrate, and it is recommended to all physicians in general practice.

Solutions of argyrol quickly deteriorate and should be freshly prepared for every case. Upon request, the State Board of Health will furnish materials for preparing fresh solutions.

It is recommended that physicians and midwives shall make one application of the argyrol solution at the birth of every child as a prophylactic or preventive treatment after having first thoroughly wiped the eyes with absorbent cotton, or soft clean linen, and bathed them with a saturated solution of boric acid.

Rule No. 3. On receipt of notification under this act, it shall be the duty of the local health officer to immediately investigate the case and satisfy himself that the rules of the State board of health are properly complied with. He shall also immediately report the case to the State Board of Health by telephone or telegraph."

The Revised Statutes of Illinois, 1915, chapter 38, page 975, "An Act for the Prevention of Blindness from Ophthalmia Neonatorum," etc. This law requires that all physicians and midwives shall advise the State prescribed prophylactic, 1 per cent. silver nitrate in the eyes of all newborn children at once after birth, and report all cases coming to their knowledge of babies' sore eyes within six hours from the time first noted. Under this act several doctors and a considerable number of midwives have been arrested, convicted, and fined for infractions thereof. A few similar convictions in Canada would have as salutary effect here as it did in Chicago. Under the above law, parents who are careless or unwilling to have their children promptly treated, were arrested, and the eyesight of the babies saved against the strong opposition of the ignorant parents. Some of this information I obtained from an interesting article in the *Modern Hospital*, January number, by Carolyn Conant Van Blarcom, R.N., Secretary of the Illinois Society for the Prevention of Blindness, and which society I wish to thank for kindly loaning me these striking posters.

We are in sad need in Canada of a publicity campaign in regard to the whole subject of venereal disease. The crime of silence must stop. The medical profession must quickly decide to be honest and open with the public on this vital question. Those doctors who desire the public to be kept in ignorance in the hope that their practices will benefit thereby, must be discredited and dishonored by all honest men.

We may look for, hope for, and best of all, work for the stamping out of venereal disease, but we shall not likely reach the goal in our generation. Deplorable as it is to have to say it, many thousands of our brave troops have become infected, especially with gonorrhœa. That is these cases have been recognized, in civil life the numbers are larger still. When the longed for peace occurs,

I feel certain that in spite of the grand work of the Army Medical Corps, there will be an epidemic of venereal disease sweep over Canada. We should make every effort right now to minimise its effects. The commission on venereal diseases is doing good work, but special and specific legislation is needed at once to stamp out blindness of the newborn which is a special problem in itself. Aside from our moral and humanitarian motives, motives which we as a noble profession claim as our birthright, the prevention of vast financial losses, sure to occur if this scourge is not checked, should appeal to the public.

The eyesight of our babies yet to be born can be saved, we can save it, and we must save it. To that end, I beseech you to take strong and effective action this very day by sending a powerfully worded resolution to the boards of health of each of the provinces and also the Dominion to at once enact proper legislation covering this matter. If the Canadian Medical Association individually and as a body determined to stamp out blindness of the newborn, they have the power and influence to wipe away this curse in one year. I therefore appeal to you on behalf of the eyesight of the babies to come, to remove this terrible plague.

N.B.—Since this paper was read, I am glad to say that Ontario has enacted legislation covering this subject. I feel very happy that I have had the opportunity of being one of the factors to stimulate such good laws, which shall have a profoundly beneficent effect on our people. Great credit is due to our Provincial Board of Health for this progressive legislation. Ontario practitioners should now whole-heartedly back this law and so encourage other provinces to enact similar.

The following Regulations were approved by the Lieutenant-Governor-in-Council, on May 21st, 1918, and published in the *Ontario Gazette*.

Regulations for the Prevention of Babies' Sore Eyes

Regulation 1—Every physician in attendance upon a lying-in-woman shall, immediately following the birth, instil into the eyes of the newly-born child a sufficient quantity (a few drops) of a one per cent. solution of nitrate of silver (supplied free by the Provincial Board of Health) or of a 40 per cent. solution of argyrol.

Regulation 2—If within two weeks after the birth of a child, one or both eyes shall become reddened, inflamed, swollen or show

any discharge, every physician, midwife, nurse or person in charge of a maternity or other hospital where such child is, and every person in charge of a child, shall forthwith report in writing to the Medical Officer of Health, the name, age and address of such child together with the circumstances of the case.

Regulation 3—The Medical Officer of Health shall, upon receipt of the report referred to in Regulation 2, and if the child is not under the care of a legally qualified physician, direct the parents, or whoever has charge of the child, to immediately place it in charge of a legally qualified physician, or if the parents or persons in charge are unable to pay the cost of such attendance, the Medical Officer of Health shall provide the necessary treatment at the cost and charge of the municipality.

Regulation 4—The Medical Officer of Health shall send a weekly report of all such cases to the Secretary of the Local Board for transmission to the Provincial Board, as required by Section 24 of the Public Health Act.

NOTE—The Laboratories of the Board at Kingston, London, and Toronto provide free laboratory facilities in all communicable diseases and venereal diseases.

RULES FOR THE PREVENTION OF BABIES' SORE EYES

What to do Before the Baby is Born

1. The care of a child's eyes begins *before* it is born.

2. The mother's parts, through which the child passes at birth, should be washed several times a day with soap and water, for about one week before the baby is born.

3. If a discharge comes from these parts, the mother should at once consult a legally qualified physician, because this discharge, if not stopped, may probably destroy the baby's eyes.

4. This discharge may be caused by gonorrhœa or it may not. In any case it should be given attention, *or a blind baby may be the result.*

5. If for any reason a doctor is not consulted, the mother should not only keep her parts clean, with soap and water, but she should use a fountain syringe to syringe out her parts, several times a day, with warm, boiled, soap and water.

6. The mother should be careful to keep her hands clean and away from her eyes, or she may get some of the poison in her own eyes, and cause blindness.

7. All cloths, etc., used by her in cleaning her parts *should be burned*, as they may cause infection. It is better to use quantities of cheap cheese cloth and then burn it.

8. If the mother has a discharge coming from her parts, she should keep away from the other people in the family as much as possible, for she may cause the same disease, and possibly blindness in them.

9. If the mother has a discharge, she should try and use a separate water closet or vessel, and keep everything perfectly clean with soap and water cleansings.

10. Unless there are proper conveniences in the home, and the attention of a good doctor, *it would be better for babies to be born in hospitals*, where everything is convenient and clean, and where the mother may be sure of a good doctor and nurse, and where if mothers are too poor to pay out money, they can be cared for free.

11. If the mother does not go to a hospital she should always call in a qualified physician.

12. If the mother is poor, she should not forget to call a visiting nurse, if one can be obtained. *Nurses know their business, and can tell the mother* what do do.

What to Do After the Baby is Born

1. As soon as the head is born the mouth should be swabbed out with a piece of cheesecloth upon a finger, the face should be washed with clean water, and the lids should be carefully cleaned.

2. After the child is separated from the mother, the face should be again washed, *without soap*, giving especial attention to the lids.

3. The eyes should now be washed out with a solution of boracic acid. To prepare this, take a pint of clean water that has been boiled and allowed to cool. Then put two teaspoonfuls of boracic acid in the water and stir it up with a clean spoon. Then open the baby's eyes and flush them out with a few teaspoonfuls of this solution.

4. The lids should now be opened and two or three drops of a one per cent. solution of nitrate of silver, or of a 40 per cent. solution of argyrol, should be carefully dropped into the eyes. *Be sure* the medicine gets into the eyes. This should be done *always*, *even* in cases where there is no reason to suspect disease. *It almost surely prevents dangerous "Baby's Sore Eyes".*

5. The drops usually make the eyes a little red for a few hours, but this does no harm. *If it is not done, a blind baby may be the result.*

6. Mothers should *be sure* that this is done, *even* if the doctor does not think it necessary.

7. Mothers should not think that breast milk, or tea leaves, or poultices, or *anything else*, will serve the purpose. Cleanliness and the nitrate of silver or argyrol solution are the only things that will do.

8. If the baby's eyes get red a few days after birth, *the baby should be taken to a physician at once.* Or, better still, take the baby to a properly qualified eye specialist *at once. Do not wait*, thinking it is "just a little cold", and hoping the eyes will get better in a day or two.

9. Do not listen to what the neighbors say. *Consult a doctor at once. Delay may mean blindness to the baby.*

10. If a newly born baby has "sore eyes," the best place for it is *in a good hospital*, where it can be properly cared for. Such cases require careful treatment *every half hour day and night.* If the child is not taken to a hospital, however, *two* paid nurses, or *two* visiting nurses, should take care of the baby day and night.

All this could have been prevented if the silver solution had been dropped into the eyes when the baby was born.

11. All cloths, cotton, etc., used around the baby's eyes should be *instantly burned.* Every one touching or treating the baby should keep perfectly clean. *The hands should always be washed immediately after touching the baby.* People coming in contact with a baby having "sore eyes" should, if possible, be kept in a *separate room*, away from the rest of the family.

The proper nitrate of silver solution is supplied *free* by the Provincial Board of Health. The Board at its laboratories in Kingston, London, and Toronto, makes free diagnosis of gonorrhœa and syphilis.

Case Reports

A QUESTION OF DIAGNOSIS

By Harry H. McNally, M.D., C.M.

Fredericton, N.B.

THERE is nothing in the science of medicine which cannot be proved. The following interesting case warrants, I think, place for publication.

Mrs. T—— B——, age thirty-five years, consulted me, giving me the following history: "I have heart disease, with dropsy. My legs are badly swollen and I am swelled clear to the abdomen. I have been dropsical for two and one half years—in fact, longer, but more markedly since my last baby's birth, two and one half years ago. The swelling goes down somewhat at night but appears to full extent the next day. It is getting worse. I have consulted many physicians in various places, and all give me one diagnosis—dropsy from heart disease. I have given up doing anything for myself except trying to care for myself—avoiding over-exertion. I have no pain, nor have I ever suffered any pain of late years. There is no swelling in my body above the abdomen."

Examination showed the legs badly swollen and the abdomen abmormally large, but palpitation revealed nothing extraordinary. The rest of the body as the patient had described was clear of swelling.

Cardiac examination showed apex in its normal position; cardiac valves appeared to my ear perfectly normal—blood pressure 125; pulse pressure 60. I therefore concluded there was no cardiac weakness. The urine was examined. There was no trace of albumen nor sugar—speciffic gravity 1020—faint acid reaction; there was no history of urinary irritation.

Pelvic examination showed nothing but uterine displacement a little to the right side—organs otherwise appeared normal. There had never been any history of jaundice. The spleen was not enlarged. *X*-ray was not used.

Received for publication June 6th, 1918

Examination of the blood showed hæmoglobin 90 and normal in every respect. Alimentary tract was in good working order.

All the causes of dropsy in the lower part of the body were apparently excluded, but one, namely—pressure on the abdomenal vena cava. It must be the vena cava because the legs were equally swollen.

I opened the abdomen and found everything as it had appeared from the outside—normal. The incision was made to permit a clear view of the liver, gall-bladder and a careful examination of the pelvic organs as well. After fixation of the uterus, a careful examination was made of the posterior abdominal region. On the right side in the vicinity of the kidney a large cystic mass was felt and below this I felt a hard stony substance. The abdominal incision was repaired, and an incision was made over and parallel with the crest of the right ilium. Reaching the mass it was found to be a cystic kidney and about two and one half inches below in the ureter was deposited a stone about as large as a horse bean. This was removed through the ureter and the mass drained and brought to the surface, opened and found to be devoid of kidney tissue. The kidney or cyst was removed with the part of the ureter between the stone and the kidney. Patient made an uneventful recovery, swelling subsiding at once from the legs and abdomen.

In the cystic kidney were found two stones and much debris but no kidney tissue could be detected. Further history elicited from the patient says that fourteen years previous she had been ill with a pain in that side, being confined to bed for several weeks and treated with hot applications, but after that had been troubled but little with her side. It is quite apparent that the obstruction had taken place in the ureter at that time. Back pressure had caused atrophy of the kidney substance, and the other kidney had gradually taken up the full work.

Editorial

THE HOSPITAL SHIP *LLANDOVERY CASTLE*

THE sinking of the hospital ship, *Llandovery Castle*, by a German submarine and the inhuman conduct of its commander, has aroused a world-wide indignation that will neither decrease in intensity nor drift into forgetfulness. Like the *Lusitania* it will, for the enemy, be remembered only too well.

The *Llandovery Castle* was torpedoed seventy miles from the Irish coast on the night of June 27th. She was on her way to England. All lights were burning, a huge electric cross over the bridge, and strings of white and green lights on either side. The red crosses on the side of the vessel also were illuminated by electric lights. The outrage was deliberate and premeditated; there is no doubt it followed upon orders given the submarine commander by the superior German authority, which alleged the presence of eight flight officers. The allegation was without foundation and could have been easily tested by right of search.

The *Llandovery Castle* had on board two hundred and fifty eight-persons, including eighty men of the Canadian Army Medical Corps and fourteen nursing sisters. Almost all the nurses were of the first division, having been out since the early days of the war in 1914. Since that period they have been doing duty at Casualty Clearing stations in France and England, and on Hospital Ships. The boat with the nurses on board capsized and all were lost. Very nobly the nurses died, without a murmur of fear, true to the high tradition of their profession! The only boat saved contained twenty-four men, including the commander Captain R. A. Sylvester, Major Lyons of the Canadian Army Medical Corps, three other officers and several C.A.M.C. orderlies.

It is noticeable that five boats were seen to get away fully loaded and there was no panic or confusion. The Admiralty report declares that the submarine after the sinking of the ship shelled an unknown target, which the latest testimony of the survivors show to have been the missing boats. The tale of crime reveals wanton deliberation on the part of the submarine commander. The submarine charged to and fro amid the wreckage to which were clinging survivors, and its commander fired revolver shots on those who were picking up drowning men and compelled them to desist. The Admiralty also reports on the cruel treatment of Major Lyons who was badly injured by rough handling.

The *Llandovery Castle*, steaming on her way under regulation lights, was plain to see and could not be mistaken for anything but what she was—a ship immune by every law of war and peace from attack or molestation. Out of one hundred and three hospital personnel ninety-seven were lost. For the doers of this evil deed there lies in wait certain doom; none will escape the sword of justice, which is not wielded by human hands. All who had a share in this awful debt to humanity will have to pay to the uttermost farthing.

Eighty-nine members of the Canadian Army Medical Corps have laid down their lives. Many of these have served with distinction; all have served with faithfulness. To the many homes bereaved throughout our wide Dominion, by this great sacrifice, we reach out a vast sympathy. We do more than this—we sound a word of cheer, since in this same tragedy of the sea is enfolded a high consolation. For your Dead have gone on to the great Beyond, and gone grandly. Merciful missioners were they on the king's highway; always responding to the cry of pain in a tortured world; always alleviating that pain; fighting destruction with reconstruction, self-devoted, steadfast, unafraid. "Service and Sacrifice," you have the countersign—"Pass on, great-hearted Company, All's well."

The following is a list of the doctors and nurses from Canada who lost their lives on board the *Llandovery Castle*:

Lieutenant-Colonel Thomas Howard MacDonald; Major Gustave Mitchell Davis, Welland, Ont.; Captain Arthur Vincent Leonard, Toronto, Ont.; Captain George Luther Sills, Tweed, Ont.; Captain William James Enright, Port Daniel, Bonaventure, Que.; Honorary Captain Chaplain Donald G. MacPhail, Kingston, Ont.; Nursing Sister Christina Campbell, Victoria, British Columbia; Nursing Sister Alexina Dussault, Montreal, Que.; Nursing Sister Carola Josephine Douglas, Swan River, Manitoba; Nursing Sister Minnie Follette, Ward's Brook, Nova Scotia; Nursing Sister Margaret Marjorie Fraser, Moose Jaw, Sask.; Nursing Sister M. J. Fortesque, Montreal, Que.; Nursing Sister Catharine Gallaher, Ottawa, Ont.; Nursing Sister Rena McLean, Souris, Prince Edward Island; Nursing Sister Mary Agnes McKenzie, Toronto, Ont.; Nursing Sister Jessie Mabel McDiarmid, Ashton, Ont.; Nursing Sister Gladys Irene Sar, Montreal, Que.; Nursing Sister Maebelle Sampson, Duntroon, Ont; Nursing Sister Anna Irene Stamers, St. John, New Brunswick; Nursing Sister Jean Templeton, Ottawa, Ont.

THE AIR FORCE AND THE MEDICAL SERVICE

THE progress of the war is making new demands on the medical services in directions unthought of two years ago. The latest of these calls is for specially trained men for the Air Force. Not long ago the medical officer attached to an aerial squadron was thought to have a sinecure position. He had few wounded to attend to as most of his casualties appeared in the Killed and Missing classes. The sick parade was not extensive as the majority of the personnel underwent no hardships or exposure. The men could take frequent baths and had no marching to do, so he had no scabies or bad feet to look for and prevent. The officers gave him even less

trouble than the men, owing to their wonderful *ésprit de corps*. He had no trouble with hygienic conditions as the aerodromes were miles from the front line, where there is no difficulty in disposing of refuse.

Until comparatively recently the medical officer justified his presence by performing these duties so far as they fell to his lot to the satisfaction of all concerned. The whole complexion of these duties has been gradually changed, until now the air-pilot or observer receives similar attention from his medical officer as the athlete at the training table does from his supervisor.

It was in the training camps in England that the startling discovery was made that practically all the accidents in training are due to the pilot and comparatively few to the machine. With the cause of the accident placed on the pilot, it follows that the catastrophe is either due to his carelessness, poor physical condition, or insufficient training. The last cause can generally be eliminated as the course of training has been so carefully studied by practical airmen, and it has proved to be sufficient, when the pilots are properly chosen and their physical condition attended to during training.

The crux of the situation, both in the training camps and at the front, lies in the careful choosing and care of the pilot. This of necessity must fall very largely on the medical service and for this work medical men of very special training are required. To choose the men properly one must combine the knowledge of the aurist, neurologist, and up-to-date general practitioner. The latter must be expert in cardiac, blood-count, and blood-pressure work. The accurate knowledge of human nature, which goes with a successful practice, will be one of his main attributes of success in this work. Too much stress cannot be laid on the all-round skill required of the medical men doing this selective work. It is obvious that many men could never become satisfactory pilots or observers, owing to their nervous temperament or their slowness of thought and action. While one would naturally insist on the

men for this service being in perfect physical condition, yet we know that one of the most successful fighters of the war was suffering from pulmonary tuberculosis, and used to have hæmorrhages between his air battles. He was finally killed in action after a long series of victories. This case is just cited to show how difficult the problem of choosing suitable men really is.

One great difficulty in the work of caring for the pilots is their reticence in revealing symptoms that would indicate any sign of excessive strain. It is only by a careful routine examination and an intimate contact with the men that troubles can be discovered soon enough to avoid a catastrophe. The first sign of staleness in a man necessitates that he stop work in the air at once—very often against his own will and possibly contrary to the wishes of his superior officer.

In this field of work there should be considerable scope for that large body of younger medical men in the army who have always felt that their hospital training and experience could be more utilized than it has been. Many of these have made a greater sacrifice than either the older or the still younger men, so it would be gratifying if their wishes could be met in this way.

The new Canadian Hospital at Joinville le Pont has now been completed. A gift from the Canadian people through the Canadian Red Cross, it has been planned and equipped with everything that medical science demands, and will be administered by Canadian doctors of tried experience. It will be in command of Colonel G. E. Beauchamp, of Montreal, a chevalier of the Legion d'Honneur, assisted by Lieutenant-Colonel J. P. Decarie, chief physician, and Lieutenant-Colonel Z. Rheaume, chief surgical officer. The new hospital contains five hundred and twenty beds, but the capacity can be further extended under canvass if the demands of the wounded require it. It is situated in a healthy and picturesque spot, on the beautiful Plateau de Gravelle, within the environs of Paris.

A MOST gratifying letter has been received from Washington from Mr. Henry P. Davidson, Chairman of the War Council of the American Red Cross, with the splendid gift enclosed of five hundred thousand dollars, a contribution to be devoted to the relief of Canadian soldiers at the front, though it is to be understood that the gift is without restrictions. A copy of the resolution adopted by the War Council of the American National Red Cross was forwarded with the gift, part of which follows:

"WHEREAS the American people profoundly and gratefully recognize the devotion of the Canadian people and the armed forces of Canada in the great war and are deeply appreciative of the spirit of heroism and self-sacrifice with which so many Americans have fought and died as members of the Canadian forces during the past years, and it is highly appropriate that the American Red Cross should extend to the Canadian soldiers a measure of assistance towards their relief and comfort, and—WHEREAS such tribute cannot be translated more serviceably or appropriately than by a gift through the Canadian Red Cross, and it is the desire of the American Red Cross to afford substantial recognition of the sentiment of brotherhood and sympathy which pervades this country in this present crisis of human affairs."

A NUMBER of physicians assembled lately in the medical room of the Toronto General Hospital to hear an address from Dr. E. E. Southard, director of the Boston Psychiatric Clinic, on the subject of "Mental Hygiene". The speaker pointed out the efforts made by science to trace the causes of feeblemindedness in order to prevent or remedy it. There were seventeen causes to which feeblemindedness could be attributed; many of these were theoretically and practically preventable. Less than five per cent. of mental weakness, he said, was caused by syphilis. The weakminded could be

divided into three classes, cases of brain disease, cases of bodily disease, where the brain disease was incidental, and to hereditary causes. Referring to the intellectual power of an individual, it was not the size of the cells, he said, as much as the spread of the cells that mattered. An individual could do as well economically with one pound of brains as with three. The size of the brain varied with the size of the body. The phenomena of speech, he considered, was a neglected field of research, from the fact that the lower animals were not gifted with this power.

Dr. Clarke, former medical superintendent of the Toronto General Hospital, has become the chief executive officer of the newly-formed National Mental and Hygiene Association.

At the convention of the American Surgical Association, held in Cincinnati, a most interesting discussion took place on the recent discovery of so-called bottled blood, known to the medical profession as citrate of blood, which has been used extensively, and with much success, on the battlefield. Sir Arbuthnot Lane told the delegates that in the recent German drive in Northern France, when the Third British Army was forced to retreat, thirty bottles of citrate of blood had been captured by the Germans. Major W. J. Mayo, of Rochester, announced that he had already enlisted one hundred persons of pure blood who will gladly offer their blood for treatment of American wounded. He said, however, that military surgeons preferred to take the blood of men who are slightly wounded behind the lines and are convalescing in hospitals there, rather than employ civilians for this purpose.

The Association

ADDITIONAL RESOLUTIONS PASSED AT THE HAMILTON MEETING

Moved by Dr. R. A. Reeve, seconded by Dr. J. Halpenny, and carried,

That, the various Provincial Medical Councils be respectfully requested to institute compulsory examinations in ophthalmology, including refraction work, and in oto-laryngology, if such are not already in force.

Moved by Dr. R. A. Reeve, seconded by Dr. D. J. Gibb Wishart, and carried,

That the Medical Faculties of the Universities be respectfully requested to confer and, as far as possible, co-operate with a view to modifying the present curriculum so as to secure an arrangement of the subjects of study which will tend to insure a more symmetrical training of the prospective practitioner for his life work.

Moved by Dr. R. A. Reeve, seconded by Dr. A. D. Blackader, and carried,

That the various Provincial Medical Councils be respectfully requesed to make physical therapy based on a more thorough course in physics, an essential feature of the medical curriculum, and a practical examination necessary in this sub-department of therapeutics.

Moved by Dr. A. McPhderan, seconded by Dr. H. B. Small, and unanimously carried,

That the members of the Canadian Medical Association view with favour the publication of the medical history of the Halifax Disaster by Professor D. Fraser Harris, of Halifax, and wish to state that in their opinion such a publication is most desirable.

FINANCIAL STATEMENT FOR 1917

For the information of our members we publish herewith the auditor's report for the financial year ending December 31st, 1917. The statement shows a slight increase in the amount received for fees. This is accounted for by the Montreal meeting, which in a measure offset the decrease in revenue, due to the reduction in the fee of members on service overseas. The balance of $397.04 shown is creditable, when we consider the fact that the Association met all its financial obligations, including the payments of the interest on its indebtedness to the shareholders of the Montreal Medical Journal Co.

The Chairman of Finance Committee,

Canadian Medical Association,

Montreal.

Dear Sir:—

We beg to report that we have completed the regular audit of the Association's books and accounts for the year ending 31st December, 1917.

The attached statement shows the cash receipts and disbursements for the period.

Your books are in their usual good order; proper receipts and vouchers were on hand for all disbursements, and all our requirements as auditors were fully satisfied.

Yours faithfully,

E. B. Savage & Co.

Montreal, P.Q., April 29th, 1918.

CASH RECEIPTS AND DISBURSEMENTS

Year Ending December 31st, 1917

Receipts

Balance in Bank—1st January, 1917		$719.84
Annual Fees paid direct	$1,904.75	
Annual Fees paid by draft	3,660.05	
		5,564.80
Reprints		382.83
Miscellaneous		286.06
		$6,953.53

Disbursements

Editorial Secretary's Salary		$600.00
Refunds paid Provincial Societies:—		
New Brunswick	$41.00	
Alberta	45.00	
Nova Scotia	33.50	
Saskatchewan	19.00	
Manitoba	44.50	
British Columbia	25.00	
Ontario	220.00	
		428.00
Journal Account:—		
Renewals and New Subscriptions	$2,668.20	
Sundries	213.74	
		2,881.94
Reprints—(Murray Printing Co.)		507.24
Clippings		52.00
Montreal Medical Journal Co. —		
Payments to Stockholders—$5,000.00 at 6%		300.00
Bonuses to Officers		400.00
General Expenses:—		
Salary—Stenographer	810.00	
Postage and Sundries	232.00	
Stationery	52.65	
Travelling Expenses	41.70	
Audit Fees	20.00	
Sundries, including Annual Meeting Telephone, etc	230.96	
		1,387.31
Balance in Bank		397.04
		$6,953.53

Certified correct:

E. B. SAVAGE & CO.,
Chartered Accountants.

Montreal, April 29th, 1918.

Obituary

THE death of Lieutenant A. Murray Clare, M.D., killed in action, is a source of keen regret to all who knew him. Prior to enlistment, Lieutenant Clare was studying for his doctor's degree in the medical school of Winnipeg University. In 1915 he enlisted as a private. About a year later he was returned, when he resumed his medical course, and at the special "khaki" convocation of the university, in December, he received the degree of M.D. Shortly after he joined the C.A.M.C., and later transferred to the R.A.M.C. Immediately on his arrival in France he was despatched to the front line, attached to an ambulance corps, but shortly received the appointment of M.O. to the Durham Light Infantry. A thoroughly fine type of Westerner, Lieutenant Clare had won for himself a wide circle of friends throughout Winnipeg and the province, and, despite the brevity of his sojourn in France, he had already won distinction for his gallant conduct in the field.

ANOTHER life has made the great surrender in a great cause. Captain W. Hale, M.D., D.S.O., a medical officer of the 42nd Battalion, has been killed by accident at the Base hospital in France. He was a graduate of Queen's University, Kingston, and gave up a promising practice to serve his country in the present war.

YET another name in the Canadian medical profession is inscribed upon the honour roll. The death has been announced of Dr. W. E. Brown, of Gananoque Junction, Ontario. Dr. Brown was a member of the medical board of examiners stationed for several months at Cornwall under the Military Service Act. He had only been in France seven weeks when an enemy gas shell burst in the door of his post. He remained on duty several hours attending to the many wounded soldiers, but was finally removed to the casualty clearing station, where, after a severe illness of eight days' duration, he passed away. He was buried in the military cemetery at Perves. He was twenty-four years of age, a graduate of Queen's University, Kingston.

ANOTHER landmark in the Canadian medical profession, and a

very fine type of the old school, has passed away in the person of Dr. Robert E. Forbes, at Bonavista, Newfoundland, on June 8th. He was a man of splendid physique, well fitted for the onerous and hazardous work of attending to the needs of a northern settlement, when the only means of transportation was by open boat or by dog sled. His ministrations were eagerly sought and promptly given, his travel in early days taking in an extensive section of country. During the past thirty-five years he has built up a wide-spread practice. Dr. Forbes graduated at McGill University, and passed his final medical examinations with honours. At all times he took a lively interest in the political life of his country, being actuated by a desire to improve conditions generally, and the district of Bonavista in particular; but at no time did he deviate from an honest opinion, and his integrity could always be relied on. Until nearly a year ago Dr. Forbes enjoyed robust health, but being obliged last March to consult a specialist, he found that the end was inevitable, and bore his sufferings with that same calm that had stood him so well during his lifetime. He was a man of strong personality, a counsellor as well as physician to his patients, and he will be sadly missed. By his death in his sixty-ninth year, Bonavista loses one of its most highly respected citizens, and the medical fraternity one of its senior members and skilled practitioners.

Dr. G. F. Slack died at Farnham on June 5th. He graduated in Arts at McGill University, then went to London, England, and became a member of the Royal College of Surgeons. For a time he filled the position of house surgeon at Charing Cross Hospital. Returning to Canada thirty-five years ago, he built up a large practice in the Eastern Townships.

Dr. H. J. Harrison died at his late residence in Montreal, on June 25th.

Correspondence

THE following report of the action of the Ontario Medical Council on the question of the relations between the profession of Ontario and the Ontario Temperance Act has been received. The report was accompanied by a letter from the Registrar, Dr. H. Wilberforce Aikins, requesting that it be published in the JOURNAL. We are glad to be able to comply with Dr. Aikins' request.

AT the first session of the annual meeting of the Medical Council, which began on the twenty-fifth day of June, 1918, Dr. Arthur Jukes Johnson, seconded by Dr. Hardy, gave notice of motion that "at the next meeting we propose to ask for the appointment of a committee to consider and express the feeling of this council with regard to the relations between the profession and the Ontario Temperance Act."

At the session first next following, Dr. Johnson moved, seconded by Dr. Hardy, the motion of which notice had been given at the preceding session, "that a Committee composed of Sir James Grant, Dr. J. M. MacCallum, Dr. Eccles, Dr. Connell, Dr. Stewart, together with the mover and seconder be appointed to consider and report on the question as to the infringement of the Ontario Temperance Act by medical men.

This motion was carried.

On the same day this committee was called together immediately after the council rose, and after the question had been fully discussed in committee, the following report was presented.

Toronto, June 27th, 1918.

To the President and Members of the Council of the
College of Physicians and Surgeons of Ontario.

GENTLEMEN:

I have the honour herewith to present the report of the special committee asked for two days ago in regard to the infringements of the "Ontario Temperance Act".

The Medical Council are of opinion that the giving of orders by medical men for the obtaining of alcoholic liquors is justified in any case in which the medical man is satisfied, "of his own knowledge" that the use of alcoholic liquor is necessary and proper for the treatment of the patient, and

That this Council would deprecate the giving of such orders upon any other ground whatever.

The Medical Council would request that the Board of License Commissioners take such steps as may be necessary to ensure that liquor sold on such orders be of proper quality and purity.

That means be taken by the Board of License Commissioners to investigate and deal drastically with all cases in which the provisions of the "Ontario Temperance Act" appear to be subverted.

All of which is respectfully submitted.

ARTHUR JUKES JOHNSON

This report was adopted subject to the addition of a clause moved by Dr. King and seconded by Dr. Stewart, "that the quantity of alcoholic liquor for internal use be limited to eight ounces."

When the above resolution was proposed, the charge against Dr. Moorhouse had not become public, but during the period of presentation of and passing by the Council of the resolution cited, a conviction had been recorded against Dr. Moorhouse in the police court, a full report of which appeared in the daily papers.

So insistent did this matter seem, that a motion was carried in the Council asking that the Executive Committee be directed to enquire into this case *ad interim* and later report to the Council. This became necessary for the following reasons:

1. If a complaint is made against a registered medical man asking the Council to take action therein, whether the initiative be taken by the Council or its Executive Committee, on the one hand, or upon the responsibility of any four members of the College, as attested by their written signatures, on the other, the complaint can only be investigated by the Discipline Committee of the Council.

2. Until the Discipline Committee has duly investigated the charge and reported its findings, the Council cannot act therein.

3. Notice must be given to the accused that he may have an opportunity of preparing his defence and of being heard before the Discipline Committee.

The action of the Council in referring this matter to the Executive Committee ensures instructions being given to the Discipline

Committee to enquire into this matter and to present their report to the Council at the earliest possible date that the Council may be prepared to deal with the whole matter.

It will be seen that these two motions while they are closely related, refer to separate conditions, the first motion refers to the way in which the profession feels towards the Ontario Temperance Act, the second one is a mandate of the Council that the Discipline Committee, a committee specially appointed for the purpose of making enquiry into all matters relating to members of the College, consider the case against Dr. H. H. Moorhouse as it appeared in the public prints and report as to their finding in the same.

Retrospect of Literature

BULLETIN No. VII. OF THE INTERNATIONAL ASSOCIATION OF MEDICAL MUSEUMS

SPECIAL WAR BULLETIN OF THE AMERICAN AND CANADIAN SECTION. EDITED BY ALFRED SCOTT WARTHIN, MAUDE E. ABBOTT, CARL V. WELLER AND LOUIS GROSS

Issued at Ann Arbor, U.S.A., and Montreal, Canada, May, 1918

LACK of space forbids anything but the briefest mention of a few of the excellent articles in this number and limits us to the portion devoted to the war. This consists in the first place of what must be recognized as extremely timely technical information upon the preservation of war specimens in the form of editorial commentary upon the British Circular Memorandum upon this subject (issued in 1915, and here republished in full), and upon the great exhibition of British specimens of war recently held at the Royal College of Surgeons of England, together with a very valuable article by Mr. E. L. Judah, of McGill University, on "The Technique of the Preservation of War Material"; and, in the second place, of more than three hundred pages of concentrated material on all phases of the war of medical and surgical interest. By far the greatest value of this part of the work is to be found in the excellent bibliography attached to each article. This, in itself,

makes the volume almost a necessity for anyone wishing to make an extensive study of any of the war problems.

Industrial poisoning in munition works and aircraft factories is taken up at length, in reference to more than a score of different chemicals, by Dr. Alice Hamilton (Hull House, Chicago). The best managed factories have the highest percentage of cases of poisoning, due, undoubtedly, to the excellence of their medical supervision and consequent accuracy of diagnosis.

The chemicals most frequently causing serious injury to the workers are nitrogen oxide and T.N.T. in munition works and "dope poisoning" (from varnishes) in aircraft factories. The pathological features of T.N.T., are especially well worked out in an additional article by S. R. Haythorn, M.D.

The pathology of gassing has been carefully worked by Carl V. Weller, M.S., M.D. The many-sidedness of this question is seen when a complete review of the gases, which the different branches of the forces come in contact with, are mentioned. Obviously phosgene, chlorine, and mustard gas cause the majority of the casualties due to the enemy. There are, however, no inconsiderable number due to the poisonous fumes that the tunnellers meet in the mine, the transporter workers in the garage, and the gunners on board ship and in the gun-pit.

The subject of disinfectants in surgery is taken up by Bernard Fantus, M.S., M.D., in so far as the chlorine derivatives are concerned. Modern ideas of surgery suffered a severe blow, when the pet theory that a severely infected wound cannot be sterilized by disinfectants was successfully attacked by Carrel. The article is not clear enough on the relative advantages of the Wright and Carrel-Dakin treatments of infection.

The literature of trench nephritis is reviewed by Martin H. Fischer. The mass of information on this subject has been carefully sifted and he has come to certain definite conclusions. He thinks most of these cases are due to infection from a primary focus in the mouth, tonsils, pharynx, bronchial tubes or wounds. The great variance of the urinary findings he attributes to involvement of different portions of the kidney. The œdema, uremia high blood pressure of nephritis do not arise from the kidney but are simply associated symptoms.

Trench feet is treated at length by Louis B. Wilson of the Mayo Clinic. There is little in the article that is not familiar to the profession, and his conclusions have been accepted by the various armies for some time. The excellent bibliography makes this a valuable work of reference.

The venereal disease problem, as it is affected by the war, is taken up by J. H. Stokes of the Mayo Clinic. He handles this time-worn subject in a manner to interest all medical men. Our efforts at dealing with this question have been almost entirely wasted by allowing ourselves to confuse the moral and public health sides of the issue. It is so obvious that the profession must be content to educate first themselves and then the public on the medical side of the question, that it is surprising so much energy has been wasted. There is a widespread need for the education of the physician on the treatment and prophylaxis of these diseases.

All the European countries at war have taken up this question in a national way, but on this continent very little has been done. In the United States the propaganda campaign has been well organized, but the only national legislation has been to prohibit the sale of liquor and prostitution within five miles of a cantonment.

In England, France, Italy, Germany and Austria free treatment and diagnosis centres have been established broadcast in all the large cities. All have spent a great deal of time in educating both soldiers and civilians on the dangers of these diseases and on the best prophylactic measures to adopt. These countries have done little to eradicate prostitution except in Germany, where the infected ones are interned, and in England, where it is an offence to knowingly communicate a venereal disease to a soldier or sailor.

A. B. Chandler, *Capt., C.A.M.C.*

The Pathology of the Skin Lesions Produced by Mustard Gas (Dichlorethylsulphide). By A. S. Warthin, Ph.D., M.D., and Carl Vernon Weller, M.D., Ann Arbor, Mich. *Journ. Lab. & Clin. Med.* (*Vol. iii, No.* 8, 1918, *pages* 447–449)

THE authors credit the discovery of this gas to Victor Meyer[1] (1886), who studied its chemical action experimentally on rabbits by bringing it into contact with the skin of the ears, and by causing inhalation of the vapour. The former action produced an intense inflammation leading to suppuration, while the vapor

produced a marked conjunctivitis, snuffles, purulent inflammation of the auditory passages, and finally death from a widespread broncho-pneumonia. Meyer claimed that even a cutaneous burn by the chemical would cause conjunctivitis and snuffles. The authors of this article have not been able to observe this effect.

Meyer[2] discontinued his experiments in 1887, owing to the disagreeable effects produced on his workers. From this time little attention has been given to the gas in the literature until its use in the present war in July, 1917.

The following symptoms are noticed among the victims of this gas: an initial tendency to sneeze, but no lacrimation, with a gradually increasing nose and throat irritation. After twelve hours there is a mucous discharge from the nose, painful inflammation of the eyes, with some pain in the head and a desire to vomit. Either blisters or an erythema is often visible on the face, neck, back, axillæ and thighs. In severe cases bronchitis and pneumonia may develop after forty-eight hours.

British army reports indicate that all the gassed cases suffered from conjunctivitis, 95 per cent. from throat and lung affections and 70 per cent. from skin burns. The latter are reported by Giraud[3] to be of two kinds, viz.: the early and late. The latter variety appear in from four to fifteen days and are light, while the former are seen after twelve hours, when the conjunctivitis is first apparent, and are always severe.

The previous pathological work on this subject has been only superficially done and has been confined to the gross lesions. This being the case, the work of the authors is all the more welcome. The results they disclose only deal with the skin burns as produced by the direct application of the gas to the skin of man and animals. The observations have been carried out in a thorough and painstaking way, while their descriptions are kept clear, lucid, and concise. The illustrations taken from photographs, both macro and microscopic, show clearly what they are intended to demonstrate.

On man the study was made of the effects produced by a drop of the chemical on the skin of the forearm. Photographs, with explanatory texts, are given of observations made at periods varying from one to seventy hours, and from four to forty-nine days. These indicate the following stages: erythema, œdema, vesicle formation, pustule, collapse of vesicle, eschar formation, beginning sloughing, separation of crust, and appearance of scar.

Microphotographs clearly showing the effects of the burn on

the different layers of the skin during the three stages are reproduced at the end of one half hour, after eighteen hours, and after thirty-six hours. The inflammatory and destructive changes are especially marked around the hair follicles, sweat and sebaceous glands. The necrotic process may continue for several days, though the slough usually separates by the nineteenth day. This is followed by an indefinite period of congestion and pigmentation.

The attempts to prevent the lesion have not been very fruitful unless done at once. They find that washing the spot at once with tincture of green soap will prevent any lesion. The authors failed to observe that water increases the intensity of the lesion as noted by some English and French writers. That this is the case, however, has been long confirmed by workers at the Front, who agree that the portions of the body where the most sweat occurs are the most likely to have severe burns. This fact is attributed to the resolution of the gas.

The observations made on animals were very similar to those on man. It was noticed that the edema was more intense and that no vesicle formation took place. Necrosis and slow healing were as noticeable as in man.

It is to be regretted that no mention was made of cardiac symptoms in the general treatise on the subject. Dyspnœa, palpitation and præcordial pain are very common symptoms of those exposed to this gas, and frequently delay for weeks a man's return to the trenches. The first aid treatment, too, might well have been stated. This has consisted for a long time in changing all the clothes of the soldier, bathing him with a solution of bicarbonate of soda and washing the mouth and upper air-passages with a similar solution. This treatment is carried out at an advanced dressing station.

A. B. C.

1. Meyer, Victor: *Ber. d. deutsch. chem. Gesellsch.*, 1886, xix, No. 3, 3259.
2. Meyer, Victor: *Ber. d. deusch. chem. Gesellsch.*, 1887, xx, No. 2, 1729.
3. Giraud, Albert: *Jour. de méd. et de chir. prat.*, November 25th, 1917, lxxxviii, 890-895.

Res Judicatæ

AN APPRECIATION OF SIR JOHN RICKMAN GODLEE'S LIFE OF LORD LISTER.* BY COLONEL JOHN STEWART, D.M.S. OFFICE, LONDON.

THIS is a book which should be on the table of every medical man, which should indeed be read by everyone who takes an interest in human history, in science, and in noble lives. For this is not only the authoritative biography of one of the greatest of Englishmen, and one of the greatest, if not the very greatest benefactor of his fellowmen, but it is also the authoritative account of the origin and development of his great work.

The author, who is a nephew of Lord Lister and a distinguished President of the Royal College of Surgeons, modestly undervalues his own qualifications for the task he undertook. He fears that personal relationship and prolonged association may have a disturbing effect on his sense of proportion in regard to the use of material. No one, especially none who knew anything of the "Chief", as his students loved to call him, can admit that he has erred here or loaded his book with unnecessary details of personal character, or conversation. Indeed, there are many who would gladly have more of this, and there are many old students who must thank Sir Rickman for words and phrases which bring back memories of the vanished hand and the voice that is still. Ah! such a voice! The fact is that there is no one living so well fitted to write this book, no one with a clearer view or firmer grasp of the essentials of Lister's work, no one with such a knowledge of the *vie intime* of the illustrious Master, in short, no one else could have written the book, or written it so well. This is one of the biographies that will endure. It is itself a work of art. The style is charming. We have here the light firm hand of the artist who knows his subject and his materials thoroughly. One cannot refrain from quoting a paragraph in which a description is given of one of the early experiments with catgut. "A young calf was secured; his father's museum on the first floor was turned into an operating room; chloroform was given and the carotid artery was tied in two places with catgut . . . I have a vivid recollection of the operation, the first at which I

* "Lord Lister," by Sir John Rickman Godlee, Bt., K.C.V.O., M.S., F.R.C.S.

assisted him: the shaving and purification of the part, the meticulous attention to every antiseptic detail, the dressing formed of a towel soaked in carbolized oil; and my grandfather's alabaster Buddha on the mantelpiece contemplating with inscrutable gaze the services of beasts to men" (p. 231).

The glimpses given of Lister's relations with the distinguished savants of his time, notably with Pasteur, of his methods of work, of his holiday pastimes and travels, of his earnestness and his strenuous pursuit of perfection in his methods, are almost tantalizing because they are so few. But the book must describe the work as well as the man.

To many, even to many medical men, Lister's work is known only as the development of antiseptic surgery, the new surgery, which by whatever name it may be called was a revelation and a revolution more beneficent to mankind than can well be estimated. It is no exaggeration to say that through the adoption of his principles millions of lives and incalculable myriads of limbs have been saved, which, under the surgery of fifty years ago, would have been lost. But the success of this achievement had behind it years of patient investigation into physiological and pathological questions, and we could wish that a volume might be published containing the substance of Lister's researches on the early stages of inflammation, the coagulation of the blood, and the influence of the nervous system. It would not be too much to say that these writings might be taken as the *Principia* of surgery, establishing for surgery, and indeed for medicine in the wide sense, what the genius of Newton did for physics.

There has been no satisfactory definition of genius. For some, genius is a capacity for hard work. Here was hard work, constant thought, unrelaxing effort, the devising of new methods, the invention of apparatus, strenuous labour of the day carried on into the night and through the night. But many an honest mediocrity has toiled bravely and patiently, and at the end, far from having won the homage and gratitude of his fellows, has had to confess that he had spent his life *operose nihil agendo.* Mere capacity for hard work is not a satisfactory definition of genius. Rather is genius a spiritual gift, something of the divine and infinite, and how then can it be defined? In the genius there is not only a power of insight and a grasp of essentials beyond his fellows, but there is an elevation of thought to planes beyond the thoughts of other men, a soul privileged to move serenely and at home in worlds not yet realized by others. It is splendid, but it is a lonely splendour.

This was the case with Lister. He was very much alone. For some years his followers were few, chiefly personal relatives, a few of his old fellow-students, and his own house surgeons and dressers. He was not seldom depressed by the apathy, the incredulity and even the hostility with which his ideas were received. This scepticism and antagonism are almost inexplicable to us at the present day. Lister was the unregarded prophet in his own country. With very few exceptions the leaders of the profession in Britain, if they did not ignore him, opposed him. It was among the juniors, the assistant surgeons and house surgeons that any interest was shown. This may have been partly due to the increasing influence of physiology and pathology in the medical schools. One is strengthened in this conviction by the fact that Lister's theory and practice were more favourably received in Germany than elsewhere, for at this time Germany led the world in physiological and pathologicalstudies, and especially in original research. At a time when an unabridged gulf of hate and horror has opened between the Germany that is and ourselves, one looks back with inexpressible sadness to the Germany that was, and its reception of the teaching of the English surgeon. There can be no doubt of the admiration and enthusiasm of his German colleagues, their generous tributes to his genius and their testimony to the benefits resulting from the adoption of his methods. And yet, to many who know the paths by which Lister sought perfection, the intuition with which logical conclusions led to severely simple and practical ends, it is a curious reflection that the German type of mind, pursuing ideals with an inexorable logic but with an incorrigible disregard of fundamental principles, has to a great extent obscured Lister's teaching and paralyzed its practice: just as, working in another sphere, it has led Germany to the abyss. One of the most interesting chapters in the book is that on "Antiseptic and Aseptic Surgery", in which the author describes the simple methods of Lister, and the elaborate ritual of the "aseptic" practice of to-day.

Probably the majority of the operating surgeons of to-day were born since the surgical world accepted Lister's teaching. If to any of them this description of Lister's own practice should seem incredibly crude and inefficient, let them remember that these were the methods which revolutionized surgery, and convinced a long doubting profession. It is probably the vanishing few who knew Lister and his work, and practised his principles who will assert with the author that "it will be a good day for surgery when a return is made to pure Listerian methods, when someone rediscovers what

Lister taught, and preaches again the doctrine which Lister preached." To champion this thesis at this time would lead to tedious and sterile argument, but this much may be said at this time: in many cases the first dressing seals the wounded soldier's fate. The aseptic operating theatre cannot be brought into the front line, but Lister's principles and Lister's practice can be applied in a barn, in a stable, in a dug-out, or in the open field."

But the author's attitude is not polemic. That is not the object of the book.

The volume, a large octavo, is beautifully printed, and has a very full index. A word must be said for the illustrations, chiefly portraits, which are of unusual excellence. The portrait of Lord Lister chosen for the frontispiece is from an amateur photograph by his friend, Mr. Bickersteth, F.R.C.S., of Liverpool, and is an admirable likeness of him as he was in the later years of his active life.

All who read these memoirs must surely be conscious of a longing to know more of the man himself, who achieved so much. They would fain know something of the hidden springs of character and conduct, the principles which guided the inward thought and its outward expression. It is perhaps one of the characteristics of the age in which we live that men of deep religious feeling are so often averse from discussing their beliefs, unless it may be, with intimate friends. There is such a general atmosphere of irreverence, scepticism and mocking cynicism that a spirit "benign and proud and shy" shrinks from exposing its deepest and truest affections, and the author, in his short preface, indicates some of the reasons why he has not dwelt more fully on the inner life of his illustrious relative. There can be no doubt that the home influences surrounding Lister as a boy, the cheerful gravity and simplicity of Quaker Christianity, moulded his character and stamped it with the sweet reasonableness and high sense of duty which were so conspicuous throughout his life. His boyhood was active and happy in a home where "there was never any question that life was a gift to be employed for the honour of God and the benefit of one's neighbour". He owed much to his father, a very remarkable man, of whom we have interesting and vivid glimpses in the early chapters, a man of unusual scientific attainments especially in optics.

In a speech in Toronto in 1897, which some readers of the JOURNAL may remember, Sir Michael Foster made a happy reference to Lister's Quaker origin. "In early life Lister belonged to a

society the members of which call all men Friends, and now in turn, because of his inestimable beneficence and service to mankind, all men the world over call him Friend."

He shared with his intimate friends, all of them men of unusual intellectual power and notable achievement, a childlike faith in the Christian religion. In the following quotation from a graduation address delivered in 1876, which Sir Rickman has taken as the title page "motto", we see, as through a window, into the pure, simple, and reverent spirit of Lister: "If we had nothing but pecuniary rewards and worldly honours to look to, our profession would not be one to be desired. But in its practice you will find it to be attended with peculiar privileges; second to none in intense interest and pure pleasures. It is our proud office to tend the fleshly tabernacle of the immortal Spirit, and our path, if rightly followed, will be guided by unfettered truth and love unfeigned. In the pursuit of this noble and holy calling I wish you all Godspeed."

Miscellany

News

MARITIME PROVINCES

The Convocation in the Faculties of Medicine and of Dentistry, of Dalhousie University, was held on May 30th, in the MacDonald Memorial Hall of the library at Studley. The special prize for excellence in histological technique was awarded to Albert Clay Hayford, a student of dentistry; the Dr. Lindsay prize for distinction in at least two subjects of the second professional examinations was awarded to Daniel William Hoar. Professor Cameron's prize for the student of first year making highest marks in practical anatomy was won by John Osler MacLean. The students were addressed by Dr. Andrew Croll, F.R.C.S., formerly of Saskatoon, who is now in charge of Camp Hill Hospital, Halifax, after being in charge of a large base hospital in France for two years. After congratulating the university on its fiftieth anniversary in medicine, Dr. Croll referred to the progress of surgery during the past fifty years, and particularly to the achievements of the French, British, and American surgeons. A few years ago, he said, it was the fashion to study Teutonic surgery as a post-graduate course, but

while one learnt a great deal in pathology from Germany, and in painstaking methods of diagnosis, one did not go to them to learn of surgical discoveries. He reminded the graduates that there was a personal factor in treatment, and that the application of personality in the sick room should form one of the recognized subjects of the medical curriculum. The German physician did not know how to treat the individual, and recognized only the disease. He asked them to think of the *quality* of their work rather than the quantity: in surgery especially, if working against time, the quality of their work would suffer. He paid a warm tribute to the Army Medical Corps, commenting not only on the services of the doctors, but of the nursing sisters, the stretcher bearers, and the orderlies.

As all men worth while in the medical world were helping out in the titanic struggle, and post graduate work was impossible at the present time, Dr. Croll advised the graduates to join the Army Medical Corps, where they would learn, at least, methods of exactitude; and when the conflict was over, they would have peace of mind when they reflected that they had "played the game" and done "their bit" during the great war.

ONTARIO

About one hundred and seventy-five medical men from all parts of Western Ontario attended the inaugural clinic of the Western Ontario School of Medicine conducted at Victoria Hospital by Dr. Thomas McCrae, head of the Jefferson College of Medicine, Philadelphia, and brother of the late Lieutenant-Colonel John McCrae. Dr. Thomas McCrae was for some time associate professor of medicine at Johns Hopkins University, and he is associate author with Sir William Osler of a "System of Medicine", "Cancer of the Stomach," and other leading medical works. The clinic exemplified the treatment, according to the latest methods, of disease of the heart, kidneys, joints and blood. The next clinic will probably be held in November. It is planned to hold four clinics a year, and to bring to London the highest and most distinguished medical authorities of international reputation, the design being to keep up with the most up-to-date developments in medical science without leaving home.

The Act for the Prevention of Venereal Diseases passed at the last session of the Ontario Legislature, went into force on July 1st.

Drastic measures will be enforced. The medical health officers have been granted considerable powers. It provides that any person under arrest or in custody can be examined if the officer has reason to believe that the person is suffering from some form of venereal disease; if found infected, this person can be detained and isolated until he has been medically treated. The regulations also authorize the medical health officer, if credibly informed that a person resident in the district is infected or is liable to infect other persons, to give notice in writing to such person requiring him to consult a legally qualified practitioner, and to procure a certificate that he is not suffering from the disease. If such certificate is not given, another doctor can be appointed to examine and report on the matter. The medical health officer is empowered to enter any house for the purpose of making inquiry or investigation with respect to the health of any person therein, and may also order their removal to a hospital. This Act is designed for the protection of innocent persons, especially women, who have been the chief sufferers from the insidious spread of this horrible disease. The Provincial Board of Health has issued a pamphlet containing the regulations respecting the treatment of venereal disease for the guidance of medical practitioners. Severe penalties are inforced for the violation of these regulations.

Dr. H. B. Anderson was elected vice-president of the American Therapeutic Society at the recent meeting held in Richmond, Va.

MANITOBA

The Manitoba Medical Association held its annual session in Winnipeg, June 20th and 21st. The association placed itself on record as being convinced that the restriction placed on the use and sale of alcohol in the province has resulted in the physical, moral and economical betterment of the people. The programme was largely clinical in nature, and most of the meetings were held in various city hospitals, including the Manitoba military hospital, at Tuxedo. One of the chief items under discussion was the control of venereal diseases.

Nurses in Manitoba, Alberta, Saskatchewan and Ontario are authorized by law to affix the letters R.N. to their name, provided they have been trained and graduated from an authorized hospital

and have passed the examinations deemed necessary by the council which passed the act.

ALBERTA

Donations to the Calgary hospitals were trebled the second year after the city began to elect fifty per cent. of the hospital trustees, and again trebled the third year. The financial reports of the Hospital Board show that donations of $317 were received in 1914, $1,035.35 in 1915, and $3,480 in 1916. This is an encouraging indication that there is no falling off in the popularity of hospitals as a result of increased public control.

Dr. F. G. Shepherd, late Dean of the Faculty of Medicine of McGill University, has just completed an investigation into the prevalance of goitre in Alberta for the Commission of Conservation, representations having been made to the Commission that the disease was becoming unduly prevalent in the province.

SASKATCHEWAN

Voting for the vacancies on the senate of the University of Saskatchewan resulted in the election of the following officers: College of Physicians and Surgeons, Dr. H. A. Stewart, of Saskatoon; College of Dental Surgeons, Dr. W. H. Falloon, of Saskatoon; Pharmaceutical Association, Robert Martin, of Regina; Battleford district, Dr. Stanley Millar, of Battleford. The College of Physicians and Surgeons, the College of Dental Surgeons, and the Pharmaceutical Association have their first representative on the senate of the University. Provision was made for such representation at the meeting of the senate on convocation day of this year.

Tenders are being called for alterations and additions to the power plant at the Provincial Tuberculosis Sanitorium, Fort Qu'-Appelle. The improvements are expected to cost about $25,000, and will include extra water mains, extra electrical equipment, which include a new boiler, two steam engines, pole lines and a new system of water lines for fire protection.

In order to meet the needs of the Prairie provinces, it is the

purpose of the Victorian Order of Nurses to establish similar institutions in the West. The Order has four training centres in Canada, Montreal, Ottawa, Toronto, and Vancouver. Miss Russell, the assistant inspector of the Order for Canada, on her recent tour through Saskatchewan remarked on the shortage of workers in the district and the necessity of additional appointments. Those who take the V. O. N. course must be fully qualified nurses to begin with. The course will last six months and consists of instruction in district work, school nursing, child welfare, social service and public health. The nurses who take the course will be Westerners, fitted to take up the work on the prairies where it is so vastly needed.

ARMY MEDICAL SERVICES

Lieutenant-Colonel Andrew Croll, F.R.C.S., formerly of Saskatoon, has been appointed to take charge of surgery at Camp Hill Military Hospital, Halifax, and to be consulting surgeon to Military District No. 6. Dr. Croll went to France early in 1915, was raised to the rank of Lieutenant-Colonel and became Chief of the Surgical Service of No. 2 Canadian General Hospital, France, in 1916, which post he held until his return to Canada in February, 1918.

Captain Charles E. Preston, of the Canadian Army Medical Corps, and a prominent orthopaedic physician, was among those wounded by the German bombing raid on No. 1 Canadian Base Hospital. Captain Preston was wounded in the scalp by a bursting bomb during the raid, and is now in a London hospital, where he is recovering. He went overseas in 1916, was stationed at the base hospital where he was wounded, and was one of the last surgeons to leave the building as the bombs from the German airplanes burst around it. He is a graduate of McGill University, Edinburgh University, and the New York Rupture and Cripple Hospital.

Lieutenant B. E. Hawke, R.A.M.C., a formerly well-known Toronto physician, has won promotion for his good work in hospital at Epsom, England; he has been appointed examiner of a travelling medical board, with headquarters at Tunbridge Wells. He is now engaged in visiting hospitals and camps reclassifying soldiers.

Major A. S. Gorrell, A.D.M.S., Military District No 12, since

the distict was organized, is to be given rank of Lieutenant-Colonel, and will be special senses consultant in diseases of the eye, ear and nose, and throat.

Colonel Evan G. Davis, C.M.G., has been appointed A.D.M.S., effective from July 1st.

Lieutenant-Colonel Joseph Hayes has been awarded the Distinguished Service Order. He was mentioned in despatches for the second time, May 28th, for distinguished and gallant service, and again on April 7th. Colonel Hayes went overseas as medical officer of the 85th Nova Scotia Battalion; six months ago he was transferred to the fourth divisional train company, and a month ago was promoted senior medical officer, central group, Canadian Forestry.

Lieutenant-Colonel Montague, graduate of 1904, who has been awarded the Distinguished Service Order and Military Cross, is on the divisional headquarters staff in France.

Captain Frank Hassard, a graduate of Toronto University in 1910, wounded in April, 1916, won the Military Cross in July, 1916, is now attached to the Field Ambulance of the Indian Cavalry.

Lieutenant A. S. Malcolmson, a graduate in medicine of Toronto University, has been mentioned in despatches.

The following list contains the Canadians named in Sir Douglas Haig's despatch of April 7th, as worthy of special mention·

Army Medical Corps.—Captain J. E. Barry, Lieutenant-Colonel G. J. Boyce, Captain H. McL. Cameron, Lieutenant-Colonel D. Donald, Lieutenant-Colonel A. S. Donaldson, Colonel J. M. Elder, Major A. W. M. Ellis, Lieutenant-Colonel A. L. C. Gilday, Temporary Lieutenant-Colonel J. N. Gunn, Lieutenant-Colonel J. A. Gunn, Temporary Captain F. R. Hahhard, M.C., M.B.; Lieutenant-Colonel J. Hayes, Lieutenant-Colonel D. P. Kappele, Quartermaster and Honorary Captain J. E. Lawrence, Major (Acting Lieutenant-Colonel) H. H. Moshier, Major G. S. Mothersill, D. S. O. Lieutenant-Colonel A. C. Rankin, Captain W. A. Richardson, Temporary Major (Acting Lieutenant-Colonel) E. R. Selby, Lieutenant-Colonel J. Stewart, Major G. S. Strathy, Captain S. J. Streight, Honorary Captain and Quartermaster J. E. Tullock,

Captain W. C. Walsh, Captain H. W. Whytock, Temporary Captain H. G. Young, D.S.O. Private S. Fairham, Private W. J. Pettengell, Staff-Sergeant A. J. Pickman, Quartermaster-Sergeant G. E. Rogers, Corporal J. Tait, Corporal O. E. Thomas, Staff-Sergeant E. T. Westby.

Nursing Service.—Sister Miss L. A. Brady, Sister Miss E. E. Carpenter, Sister Miss C. A. Donnelly, Sister Miss M. J. Fortescue, Matron Miss M. Goodeve, Sister Miss E. MacL. Gordon, Sister Miss R. Hally, Sister Miss S. M. Jenkins, Sister Miss W. M. Lamphter, Sister Miss M. MacDonald, Sister Miss S. Robertson, Matron Miss E. M. Wilson.

Captain H. J. Watson, M.D., of University of Manitoba and Toronto, has been appointed Major in the United States Medical Reserve Corps. He was formerly in the C.A.M.C.

The official list of recent promotions in the C.A.M.C. are as follows:

Colonel (Temporary Surgeon-General) G. L. Foster, C.B., to be Temporary Major-General.

Temporary Lieutenant-Colonel J. G. Adami to be Temporary Colonel.

Temporary Captains to be Temporary Majors: W. T. Ewing, J. E. McAskill, M.C.; F. E. Watt, N. C. Sharp, R. G. Armour, A. A. MacKay.

Temporary Major H. L. Harris to be Temporary Lieutenant-Colonel.

Temporary Captain (Acting Major) W. C. Laidlaw to be Major.

Temporary Captains (Acting Majors) R. J. Gardiner, M.C.; G. W. Hall; H. W. McGill, M.C., to be Temporary Majors.

Lieutenant-Colonel H. M. Robertson to be Temporary Colonel.

CASUALTIES

Killed in Action

Lieutenant A. Murray Clare, C.A.M.C., of Winnipeg

Killed at Base Hospital

Captain W. Hale, C.A.M.C., of Gananoque, Ontario

Killed in Air Raid on Hospital

Nursing Sister G. M. Wake, C.A.M.C., of Victoria

Died of Wounds

Dr. W. E. Brown, C.A.M.C., of Gananoque Junction, Ontario

Wounded

Captain C. E. Preston, C.A.M.C.

Book Reviews

MEDICAL SERVICE AT THE FRONT. By LIEUTENANT-COLONEL JOHN MCCOMBE, C.A.M.C., and CAPTAIN A. F. MENZIES, C.A.M.C. Publishers: Lea and Febiger, Philadelphia and New York.

THIS little book has been dedicated to the Right Honourable Sir Robert Borden, G.C.M.G., and contains a foreword by Surgeon General J. F. Fotheringham, D.G.M.S., Ottawa. It should fill a long-felt want owing to the clear and accurate manner in which it is written, and the plentiful assortment of illustrations showing the different formations and the details of construction of the medical posts.

The arrangement of the book follows the position of the different units as regards the Front—thus we find first a description of the combatant troops, then the Regimental Medical Officer, Field Ambulance, Assistant Director of Medical Services, the Corps Medical Personnel, the Cavalry Medical Units, and finally the Casualty Clearing Station.

The authors have not divided up the book according to the importance of the different subjects, as only fifteen pages are devoted to the Regimental Officer and ten to the Casualty Clearing Station while fifty-seven are given to the Field Ambulance. This allotment is out of all proportion to the importance of the work, as, with efficient and well trained Regimental Medical Officers the Field Ambulances should be merely a connecting link joining the Casualty Clearing Station to the Front and treating cases too

trivial for hospital care. In other types of warfare the relative importance would be again changed.

This point has been emphasized owing to the general impression that any medical officer will do for regimental duty. This is no doubt true in peace time, but in the trenches the varied duties of a medical officer call for a man of wide experience, not so much as a scientific physician but as a student of human nature.

This book should be in the hands of all medical officers who have not seen service in the trenches and should be studied by all medical officers proceeding overseas.

A. B. C.

Books Received

The following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

Dietotherapy. By William Edward Fitch, M.D., Major Medical Reserve Corps, U.S.A., formerly lecturer on surgery, Fordham University School of Medicine, Vol. I.—Chemistry and Physiology of Digestion Classification and Analysis of Foods. Vol. II.—Nutrition and Diet in Health. Vol. III.—Nutrition and Diet in Disease. Publishers: D. Appleton & Company, New York and London, 1918.

Medical Diseases of the War. By Arthur F. Hurst, M.A., M.D., F.R.C.P., temporary major, R.A.M.C.; physician and neurologist to Guy's Hospital. Second edition, revised and enlarged. Price, 12s. 6d. net. Publishers: Edward Arnold, 41 Maddox Street, London, W., 1918.

The Ungeared Mind. By Robert Howland Chase, A.M., M.D., physician-in-chief Friends Hospital (for Mental Diseases). 338 pages, illustrated. Price, $2.75. Publishers: F. A. Davis Company, Philadelphia, 1918.

Medical Contributions to the Study of Evolution. By J. G. Adami, M.D., F.R.S., F.R.C.P. 361 pages, with illustrations. Publishers: Duckworth & Co., 3 Henrietta Street, Covent Garden, London, W.C., 1918.

Surgery of the Spine and Spinal Cord. By Charles H. Frazier, M.D., Sc.D., professor of clinical surgery and surgeon to Hospital of University of Pennsylvania; with the collaboration of Alfred Reginald Allen, M.D., associate in neurology and neuropathology, University of Pennsylvania, Philadelphia. 922 pages, with illustrations. Publishers: D. Appleton Company, New York and London, 1918.

The Action of Muscles, including Muscle Rest and Muscle Re-education. By Willian Colin Mackenzie, M.D., F.R.C.S., F.R.S., member of the Council of the Anatomical Society of Great Britain and Ireland, and of the Staff of the Military Orthopædic Hospital, Shepherd's Bush, London. 249 pages, with illustrations. Price, 12s. 6d. net. Publishers: H. K. Lewis & Co., 136 Gower Street, London, W.C., 1918.

Syphilis and Public Health. By Edward B. Vedder, A.M., M.D., lieutenant-colonel, Medical Corps, United States Army. Published by permission of the Surgeon-General United States Army. 300 pages. Price, $2.25. Publishers: Lea & Febiger, Philadelphia and New York, 1918.

Animal Parasites and Human Disease. By Asa C. Chandler, M.S., Ph.D., instructor in zoology, Oregon Agricultural College, Corvallis. 533 pages, with illustrations. Publishers: John Wiley & Sons, New York, 1918.

Modern Operative Bone Surgery, with Special Reference to the Treatment of Fractures. By Charles George Geiger, M.D. 273 pages, with 120 illustrations. Price, $3.00 net. Publishers: F. A. Davis Company, Philadelphia, 1918.

Medical Service at the Front. By Lieutenant-Colonel John McCombe, C.A.M.C., and Captain A. F. Menzies, M.C., C.A.M.C. Price, $1.25. Publishers: Lea & Febiger, Philadelphia and New York, 1918.

Lessons from the Enemy. How Germany Cares for Her War Disabled. By John R. McDill, F.A.C.S., major, medical reserve corps, U. S. Army. Price, $1.50. Publishers: Lea & Febiger, Philadelphia and New York, 1918.

A Diabetic Manual for the Use of Doctor and Patient. By Elliott P. Joslin, M.D., assistant professor of medicine, Harvard Medical School. 179 pages, with illustrations. Publishers: Lea & Febiger, Philadelphia, and New York, 1918.

Canadian Literature

Original Contributions

The Canadian Journal of Medicine and Surgery, May, 1918:

Pernicious anæmia with special reference to its surgical management . . . N. M. Percy.

Le Bulletin Médical de Québec, February, 1918:

Blenorragie psychique . . . . G. Ahern.

La propagande qui s'impose . . . L. F. Dubé.

No. 1 CANADIAN GENERAL HOSPITAL CLINICAL SOCIETY

Meeting January 10th, 1918

Present the following officers: Colonel Simpson, president; Lieutenant-Colonel Gunn; Majors Gwyn, Harrison, Ower, Ruttan, MacDermot; Captains Baragar, Bunn, Forsyth, Fraser, Howes, Inglis, Kenny, Lauchland, Logie, MacKay, McAskill, Moffatt, Swan, Wade, Wark, and a number of visitors, including Sir John Rose Bradford, consulting physician, Etaples.

Programme

Case No. 1. *Pathological Specimens. Lungs from case of acute purulent bronchitis.* Demonstrated by Major Ower.

Captain McAskill gave an outline of the case from which the specimens were taken.

Case No. 2. *Case presenting symptom-complex of Banti's disease.* Demonstrated by Captain Logie.

The family history as read showed nothing of importance. In the physical examination it was noticed that the mucous membrane was of a pale colour, and the skin dirty white. The patient was running a slight intermittent fever. The pharynx

was unusually clear. There was definite swelling of the abdomen in the left upper half, the notch of which can be felt, and there is a prominent boss towards the epigastrium. No heart murmur. Analysis of the urine shows well marked nephritis; examination of blood showed well marked secondary anæmia. Red blood cells, 3,200,000; white blood cells about 5,000; hæmoglobin 60 per cent. Differential count normal.

A second examination made to-day, together with urinalysis, confirms the condition found in the first examination. Wassermann test was positive, but there was no history to suggest a venereal condition.

Sir John Rose Bradford in discussing the case, stated that he thought, from the information given by Captain Logie, that probably it was one of Banti's disease. The blood was typical of the disorder. A point brought out in the course of Sir John's remarks was, that there is a small group of cases seen in France resembling distantly this patient, accompanied by enlargement of the spleen, profound illness lasting several months, and in many cases followed by complete return to health, and disappearance of the splenic tumour. Superficially the cases approached one of the stages of what is known as Banti's disease.

Case No. 3. *Surgical Cases.* Major Harrison, Captain Lauchland.

(a) Captain Lauchland presented a case of osteomyelitis (chronic), showing bony changes by *x*-ray. Patient was quite able to walk.

(b) Major Harrison stated that his purpose in presenting his cases, was with a view to bringing to notice the subject of I. C. T.'s, and of showing that it is a matter of greater interest than is generally shown. He mentioned that there is a wastage of man power caused by the way in which cases were usually treated, which permits of men being kept in hospital for some time; whereas if better attention and treatment were given, the patients would be enabled to return to the line in a much shorter time.

Major Harrison named six different kinds of these cases. Colonel Simpson, Colonel Gunn, Major Gwyn and Captain Kenny discussed the cases.

An interesting case of atrophy and spastic condition of the leg presenting difficulties in diagnosis, was presented for diagnosis by Captain Richmond.

The meeting then closed.

The Canadian
Medical Association Journal

Vol. VIII. SEPTEMBER, 1918 No. 9

COMBINED INQUIRY INTO THE PRESENCE OF DIPHTHERIA AND DIPHTHEROID BACILLI IN OPEN WOUNDS

By Colonel J. G. Adami, Major F. B. Bowman, Captains F. Adams, A. G. Fleming, C. D., Farquharson, C. Imrie, and R. M. Janes, C.A.M.C.

THERE appeared in the *Journal of the American Medical Association* for September 8th, 1917, an article by Majors J. G. Fitzgerald and D. E. Robertson of No. 2 Military Division, Canada, entitled "Report of an Outbreak of Diphtheric Wound Infection among Returned Soldiers." These observers report that as the result of a thorough investigation of all infected wounds in returned men of the C.E.F. in their Division, carried out between May 20th and June 7th, 1917, no less than forty out of sixty-seven cases afforded cultures of *B. diphtheriæ*. They admit that in some cases the infection may well have been conveyed from case to case by a nurse whose duty it was to dress the suppurating amputation cases. This nurse was found to have a slight wound of the index finger which yielded cultures of *B. diphtheriæ:* particulars are given which indicate that she may have distributed the infection from wound to wound. That she could not be held entirely responsible for the outbreak is shown by the fact that other cases with infected wounds showed themselves in soldiers who had returned to Canada after the nurse had been taken off duty and sent to the isolation department; two or three cases were discovered in men immediately upon their arrival in Toronto from overseas. And the authors conclude: "It was extremely probable, therefore, that patients with diphtheric wound infection were being returned to Canada from overseas."

The extraordinarily high proportion of positive cases affording cultures of the diphtheria bacillus from wounds in this outbreak is undoubtedly calculated to afford the impression that infection of open wounds with *B. diphtheriæ* is a common, not to say widespread, condition in military hospitals overseas. That the characteristic membrane formation occurred in certain of their cases, but not in all, is evident from their description and illustrations. From that description it is equally evident that in some cases the existence and isolation of virulent Klebs-Loeffler bacilli was proved by inoculation experiments. Their paper would have been more complete had precise figures been given regarding these matters, One of the two authors is a bacteriologist and serologist of distinction, Director of the Serological Institute of the University of Toronto, to the activities of which, in the preparation of antitoxins and vaccines, the Canadian Expeditionary Force and Canada at large is heavily indebted. Of the existence of the epidemic in Ontario in 1917 there is no doubt; that there were cases of infection of wounds with virulent diphtheria bacilli and membrane formation is not disputed. The fact that some of the cases are reported to have afforded cultures of the diphtheria bacillus immediately upon arrival in Toronto from overseas, rendered it essential than in England an inquiry be set on foot to determine the frequency of the presence of *B. diphtheriæ* and allied diphtheroids in the wounds of patients in Canadian military hospitals.

To our knowledge no such investigation on an adequate scale has hitherto been attempted. It is not an easy matter, but on the contrary demands much laborious work on the part of the bacteriologist, and when it is remembered that in hospitals of 1,500 to 2,000 beds the daily routine is in itself sufficient to occupy fully the time of the laboratory staff, the additional work thrown upon that staff by an investigation of this order is no light matter. It is not sufficient to make smear cultures from the wounds upon Loeffler's blood serum, and to call any granulated bacteria diphtheria bacilli, and that because non-toxic diphtheriods may be present in wounds and may grow equally well upon "Loeffler," and, what is more, in general when stained may show the palisade arrangement and the metachromatic granules that used to be regarded as characteristic of the Klebs-Loeffler bacillus. All such bacteria have next to be gained in pure culture, and put through their paces on media containing different "sugars". This will throw out all the diphtheroids. But even this is insufficient. There are strains which morphologically and by fermentation test

conform wholly with the *B. diphtheriæ*, but are absolutely harmless. It is necessary with every strain answering to the properties of the *B. diphtheriæ* to conduct inoculations upon the guinea-pig, thereby to determine whether it is harmless or pathogenic, or if such a course be regarded as a "counsel of perfection" this must be laid down, namely (1) that in the absence of clinical signs no bacillus can be accepted as the genuine Klebs-Loeffler bacillus without the confirmatory proof of inoculation, and (2) that where in a wound there is glazing and membrane formation, inoculation must be employed to demonstrate that this is due to the diphtheria bacilli present, and not to the *Micrococcus aureus* or other organism; when this has been proved, then other cases in the ward showing membrane formation may reasonably be diagnosed as diphtherial from microscopical and cultural findings without the test of inoculation.

Early in August information regarding the outbreak in No. 2 Military Division was forwarded by the D.G.M.S., Ottawa, to the D.M.S. Canadians, and the A.D.M.S. in England were advised and asked to issue the necessary instructions for a bacteriological examination of all open suppurating wounds in Canadian hospitals (A.M.D. 25-1-5 of August 10th, 1917). If the number of cases in any area was very large, it was held sufficient that every alternate case be examined. So also it was asked that the personnel of the hospitals be examined to determine the existence of diphtheria "carriers". Subsequently in the Shorncliffe area this examination for carriers was restricted to a group of the larger hospitals, active and convalescent.

"Carriers"

As regards carriers, the outcome of the investigation was to demonstrate a striking absence of carriers among the personnel of the different hospitals. Most hospitals report "all negative". The pathologists at Eastbourne and Orpington (Captains Douglas and Imrie) afforded nominal rolls of the personnel examined. At the former hospital cultures from the throats of one hundred and fifty-seven officers, N.C.Os., nursing sisters, and men yielded no Klebs-Loeffler bacilli, and only three growths of diphtheroids (no *B. diptheriæ*). Similarly from Orpington the report showed one hundred and eleven of the personnel examined, not a single culture obtained of the Klebs-Loeffler bacillus, but twenty-four throats yielded Hofmann's bacillus (the common diphtheroid of the throat).

Infection of Wounds. Preliminary Observations

The replies regarding the bacteriological examination of suppurating wounds were not so complete. Many hospital laboratories were not in a position to carry out the investigation, they were not equipped for an investigation on so extensive a scale, nor had they the requisite staff to carry it out in addition to the insistent routine work. Captain Fleming, pathologist at the Duchess of Connaught Canadian Red Cross Hospital at Taplow, reported that for some little time in connexion with the Carrel-Dakin and Flavine treatment of wounds they had conducted a routine examination, with cultures, of all suppurating wounds, and had never encountered *B. diphtheriæ*. Captain T. R. Little reported from the Central Laboratory at Hastings that few cases with suppurating wounds came into the hospitals of that area; he had made a full bacteriological examination of six cases, of which four yielded diphtheria-like organisms. 0·5 c.c. of a standard suspension of a twenty-four-hour culture of *B. diphtheriæ* inoculated into guinea-pigs or young rabbits will cause death within seventy-two hours. Taking these four cultures he had inoculated with 0·5, 1·0 and 1·5 c.c. of suspensions of each into young half-grown rabbits, and not one of them had succumbed. It deserves note that prior to the war, Captain Little had been engaged upon a study of the diphtheroids.

Combined Investigation

Here the matter rested until the appearance of the paper above-mentioned by Majors Fitzgerald and Robertson, when the D.M.S. Canadians directed that at the Central Laboratory, Folkestone, and at Nos. 4, 15 and 16 Canadian General Hospitals, a combined investigation be made into the matter of the infection of open wounds by members of the diphtheria group. At these centres it was considered that conditions were such, both as regards the nature of the cases admitted and the laboratory accommodation, as to afford the most favourable conditions for the inquiry. Subsequently it was found that the laboratory at No. 4 Canadian General Hospital was not prepared to undertake the investigation, this hospital having only recently been transferred from Salonika, and the laboratory was not as yet in full working order.

From the office of the D.M.S. directions were forwarded to each participating laboratory detailing the scope and plan of the

investigation. These directions were full and precise. Their main features may here be referred to in abstract. The attempt was made to reduce to a minimum the procedure for differentiating between the different members of the diphtheria group, and to provide methods which had been tested and proved reliable. (1) Sterilized swabs, labelled, were to be provided for use in the wards. (2) Fresh smears were to be examined by either Loeffler's or Neisser's method, and attention was called to the fact that the majority of wound diphtheroids are indistinguishable from the Klebs-Loeffler bacillus under the microscope. (3) Blood serum plates were recommended in place of slanted test tubes for the first cultures. (4) Pure cultures of the diphtheroids recognized were to be obtained on blood serum slants (*B. diphtheriæ* colonies remain white, wound diphtheroids often, as they become older, acquire a pinkish or yellowish tinge). (5) For the sugar tests of these pure cultures Hiss's serum water medium was recommended as base, plus 1 per cent. of the sugar, together with azolitmin or litmus as indicator.* Four sugars only were to be used; dextrose, lactose, saccharose, and dextrine. These four saccharides were chosen in the first place to ensure the recognition of *B. diphtheriæ*. Dextrose (glucose) is a typical monosaccharide, lactose a useful disaccharide. Neither saccharose (sucrose) nor dextrine are for general bacteriological purposes regarded as of first importance, *i.e.*, with other bacterial species. The latter, it is true, is a representative polysaccharide, yet care is requisite in the preparation of dextrine broth, lest it be overheated and undergo hydrolysis with production of dextrose and levulose (this was noted in the directions given). But with a striking constancy the Klebs-Loeffler bacillus ferments dextrine with production of acid, and fails to ferment saccharose. Saccharose and lactose are also useful in differentiating between the other members of the group. As regards the other saccharides, levulose (as between the main members of the group) reacts in the same way as does dextrose, and might therefore be excluded. The same is largely true of maltose, and where it is not, the confusion that has been introduced by some members of what in other respects is the same sub-group fermenting this sugar, and others failing to ferment it, renders its employment inadvisable. Mannite could be neglected, since it is not fermented by any members of the group.

* Mellon objects that litmus is not a sufficiently delicate indicator, and recommends Andrade's medium, or, failing this, neutral red. Azolitmin was recommended after a careful test. Major Bowman and Captain Adams found that constant results were obtained by eight days' and even by four days'-growth in the Hiss's medium.

Other glucosides are both difficult to procure in a state of purity, and when procured do not afford constant results; their use, that is to say, is corroborative rather than of fundamental importance. We admit that glycerine might have been added to the series. Mellon has found this representative of the alcohols of distinct service in differentiating between the diphtheroids. Our object, however, was not so much to make a full differentiation between the many members of the group, as with the greatest economy of material and labour to recognize the main types, and above all to distinguish clearly between *B. diphtheriæ* and the other members. All forms which produced acid with dextrose and dextrine, and were negative with saccharose, were to be regarded provisionally as the Klebs-Loeffler bacillus; all others as diphtheroids. The following formulæ were afforded:

	Dextrose	Lactose	Saccharose	Dextrine
B. diphtheriæ	+	+	—	+
B. hofmanni	—	—	—	—
B. xerosis	+	—	+	—
Wound diphtheroids	+	+	+	+

(6) *Toxin Formation.*—The determining test as between the diphtheria bacillus and diphtheroids is toxin formation. The investigation was planned to discover in the first place whether virulent microörganisms are to be encountered in open wounds, and only in the second place how frequently other members of the group gain entrance to wounds. What determines whether a given organism is the true Klebs-Loeffler bacillus, and therefore of serious import, is not its morphology or staining reactions, or cultural characteristics, but its capacity to produce ectotoxins, and thus to affect the health of the patient. Detailed directions were therefore given as to the preparation of a broth, according to Dean's method, found to be most favourable for the rapid production of toxins. Having made twenty-four hours' growths in Erlenmeyer flasks of the bacilli to be tested, a guinea-pig was to be inoculated subcutaneously with 1·0 c.c. of the same. If toxic effects were produced, then four guinea-pigs were to be taken; two of them were to be given each 300 units of anti-diphtheria serum, and now one normal and one immunized guinea-pig were to be inoculated with 0·5 c.c. of the twenty-four hours' broth culture, and the other pair with 1·0 c.c. If the growth was one of true virulent diphtheria bacilli, the larger dose should cause death of the untreated guinea-pig within twenty-four hours.

A separate report was asked for each case affording members of the group, both true Klebs-Loeffler bacilli and diphtheroids.

It is generally agreed by those engaged in this investigation that no dependence can be placed upon smears from wounds as discovering the presence or absence of bacilli of the diphtheria group. This fact, in itself, is evidence of the absence of widespread diphtherial wound infection. Where there is widespread infection with membrane formation it should not be difficult to encounter the characteristic bacilli in relative abundance. Presence or absence of diphtheroids was determined by smears from the first, mixed, cultures on blood serum plates. This has introduced a difficulty in affording exact statistics, *e.g.*, at Folkestone bacilli resembling *B. diphtheriæ* were detected forty-one times, and that from forty cases, but from only twenty-four out of these forty cases were pure cultures isolated and studied,* one wound affording two separate diphtheroid organisms. Thus our first table giving the number of cases affording bacilli belonging to this group does not tally with the second table giving the relative frequency of the different members of the group isolated.

Results

The results obtained by this combined investigation may here be succinctly tabulated:

Laboratory and Observer	Number of cases examined	Number affording true *B. diphtheriæ*	Number affording diphtheroids
No. 1 Canadian General Laboratory, Folkestone. Captain F. Adams	121	1	40
No. 16 Canadian General Hospital, Orpington. Captain C. Imrie	60	1	7
No. 15 Canadian General Hospital, Taplow.			
(1) Captains A. G. Fleming and R. M. Janes	100	0	0
(2) Captain C. D. Farquharson	25	0	9
	306	2	56

The following additional data deserve note:

(1) *Folkestone.*

Two cases afforded growths which culturally, tinctorially, and

* That any of the seventeen remaining cases were those of true diphtherial infection is improbable from the fact that the method of isolation employed was that which has proved itself the optimum for isolation of *B. diphtheriæ*.

by the fermentation tests had the properties of the Klebs-Loeffler bacillus. One of these (No. 69, a sloughing stump of the thigh) afforded two separate strains of diphtheria-like bacilli. Of these one gave the sugar reactions of a wound diphtheroid, the other of the Klebs-Loeffler bacillus. Upon inoculation into guinea-pigs both were found non-virulent, like results being obtained on repeating the test. The other case (No. 77), with a granulating ulcer on the leg, gave virulent diphtheria bacilli, 1·0 c.c. of the broth culture causing death within forty-eight hours, with œdema at the site of injection and bright red suprarenals. Regarding this case, it is interesting to note that further inquiries elicited that the man had been isolated when coming out of the trenches in France as a case of suspected diphtheria. The strains of wound diphtheroids isolated were almost entirely of the *B. xerosis* type, one alone affording the sugar reactions characteristic of *B. hofmanni.*

Captain Adams reports at a later date "the cultures that gave the proper sugar reactions for true diphtheria kept on sub-culture their small colonies, characteristic morphology and staining for at least two months. On the other hand the diptheroids, after a week or two, changed their character. The colonies originally too robust for true diphtheria became still bigger, and many of the strains developed a creamy or pink colour. The bacilli also shortened, and many strains lost their granules."

(2) *Orpington.*

Captain Imrie's report from Orpington is strikingly similar, both as regards the immediate and the late results. Here also two strains were isolated which, until inoculation tests were made, appeared both to be the genuine Klebs-Loeffler bacilli; upon inoculation one of the two was found to be non-virulent. The other diphtheroids were of the usual wound diphtheroid type (negative to dextrine) with one exception. He likewise calls attention to the coarser, more confluent growth of the diphtheroids isolated by nim, and their assumption of a yellowish colour.

(3) *Taplow.*

The results at Taplow are curious and interesting. Captain Fleming had prior to the war made yearly for the Toronto Board of Health several thousand examinations, microscopical and cultural, in cases of diphtheria and suspected diphtheria. Add to this that for months he had been engaged upon the routine study of wound bacteriology at Taplow, particularly in connexion with the progress of wounds subjected to the Carrel-Dakin treatment. Prior to taking up this particular investigation he had never en-

countered diphtheria-like bacilli at No. 15 Military Hospital. For the purpose of this examination he and Captain F. M. Janes studied approximately 100 wounds by the routine laid down (they forward sixty detailed negative reports and offered to make out the remainder if desired). An analysis of the sixty reports forwarded shows that swabs were made from open wounds of various orders and varying duration from two weeks to twenty-two months, subjected to various orders of treatment, drainage (nine cases), Dakin's (thirteen), fomentations (five), saline (twenty-one), etc. These results varied so widely from those obtained at Folkestone and Orpington that the two observers offered to engage in another series, when both were transferred elsewhere. Captain Farquharson, who succeeded, undertook this additional investigation some two months later, and now in a series of twenty-five cases encountered diphtheroids nine times. Of these nine only one was the commoner type of wound diphtheroid negative to dextrine, five were of the rarer type fermenting dextrine, two were of the xerosis type, and one *B. hoffmanni*.

Combining these results into a table we find the following:

Dextrose	Lactose	Saccharose	Dextrine		Folkestone	Orpington	Taplow	Total number of diphtheroids
+	+	+	+	Wound diphtheroids (type I)	0	1	5	6
+	+	+	—	(type II)	0	5	1	6
+	+	—	+	*B. diphtheriæ*, virulent	1	1	0	2
+	+	—	+	" non-virulent	1	1	0	2
+	—	+	—	Wound diphtheroids(III), xerosis type	21	0	2	23
—	—	—	—	*B. hofmanni*	1	0	1	2

Taking these two tables it will be observed that the results obtained are strikingly at variance with those reported by Majors Fitzgerald and Robertson. In place of forty out of sixty-seven cases, or practically 60 per cent. of open wounds affording cultures of true virulent Klebs-Loeffler bacillus, we find two out of (approximately) three hundred and six, or under 0·6 per cent. Even if we accept the non-virulent bacilli of Klebs-Loeffler type as true diphtheria bacilli, the figure is raised only to a little over 1·0 per cent. The total number of diphtheroid strains isolated affords a percentage far below that of the *B. diphtheriæ* isolated by the Toronto observers.

Discussion

In a careful bacteriological study of open wounds made at three important Canadian medical centres in England there is complete absence of widespread infection of wounds by *B. diphtheriæ*. The Toronto epidemic of such infection is, we believe, the first recorded among the soldiers of the Allied Powers during the course of this war.

It is well recognized to-day that non-pathogenic diphtheroids are widely spread. Even these, while commoner, are not frequent inhabitants of wounds.

Thanks more particularly to the introduction of the newer methods of antiseptic treatment of wounds, never has there been so extensive and intensive a study of the bacteriology of wounds as during the present war. For the establishment and control of these newer methods repeated cultures have come into vogue, and had diphtherial infection been common in Europe, numerous observers would before this have called attention to the fact. We find, on the contrary, no reports upon the epidemic spread of diphtherial infection. That individual cases occur our own observations clearly demonstrate. What is more, in addition to the two cases here reported, two other cases have been notified as occurring at No. 5 Canadian General Hospital, Liverpool. But upon further inquiry into these cases we learn that in the earlier of the two (Pte. P——, 228808) this was recorded by the Pathological Department of the Thompson-Yates Laboratories of the University of Liverpool as yielding a free growth of staphylococci and "a few apparently typical diphtheria bacilli." With regard to the second case, that from Sergeant W——, 38385, this was one of eight swabs received, and was returned as positive. In neither case were tests made for pathogenicity. The officer in charge of the 1st Western General Laboratory, who reports these facts, states further that owing to the cost of guinea-pigs, pathogenicity tests are not made as a routine; occasionally attention is drawn to the fact that diphtheria-like bacilli are not necessarily pathogenic, and he adds: "Only recently an assistant in a neighbouring laboratory had diphtheria-like bacilli present in the throat which, however, were negative to the pathogenicity test." It will be seen thus that diagnosis in these two cases was made simply from the appearance of the mixed cultures obtained from swabs, and that this being the case, the evidence that these two patients showed

genuine and virulent diphtheria bacilli in their wounds is far from complete.

That epidemic spread of diphtherial infection of wounds might under circumstances manifest itself is freely admitted. In Major Fitzgerald and Robertson's account of the nurse with the infected finger we have an excellent instance of how this may be brought about. We are, however, of the opinion that the widespread use of eusol, Dakin's mixture, flavine, and other antiseptic solutions in Canadian hospitals in England has reduced the danger of such spread to a negligible amount. As regards the non-pathogenic diphtheroids, indeed, our figures indicate, we consider, the existence of a low grade of local or endemic prevalence. Thus it is deserving of note that wound diphtheroid (I) was the common form at Taplow, wound diphtheroid (II) at Orpington, while bacilli of the xerosis type predominated in the Folkestone area. We would not, however, lay too great a stress upon these findings.

On the Classification of the Diphtheroids

It may be asked by those who have not followed the literature: What is the nature of these wound diphtheroids?

In 1888 von Hofmann-Wellenhof of Graz, in Austria, called attention to the frequent presence in the throat and mouth of a perfectly harmless Gram-positive bacillus of irregular breadth which might easily be mistaken for the true diphtheria bacillus. Loeffler in his original communications had noted the existence of these harmless forms. For years this was regarded as an attenuated strain of the virulent germ, and as such spoken of a *B. pseudo-diphthericus*. With the discovery that this form was incapable of fermenting dextrose and other sugars, and was therefore quite distinct from the Klebs-Loeffler organism, the first name was seen to be inappropriate, and now this form is more generally known as *B. hofmanni*. Slowly, but at an increasing rate, other non-diphtherial organisms have been detected in the air, in water, and in the human body and its passages, often becoming regarded as the cause of one or other condition of disease, *e.g.*, Hodgkin's disease, general paralysis, etc., until it came to be recognized as urgent that the group should be carefully studied, and the members classified.

The first notable attempt at such a classification on any considerable scale was made by Hoag* of Boston in 1907. He made

* *Boston Med. and Surg. Journ.*, 1907, x, 197.

an analysis of the properties of the hundred and ninety-nine pure cultures of members of the groups, including among these one hundred and forty-six growths of what he termed provisionally "organism X" (a diphtheroid which he had isolated more particularly from the insane patients at the Danver Insane Hospital), seventeen strains of the Klebs-Loeffler bacillus, four of Hofmann's bacillus, etc. A still more thorough analysis was made in 1912 by Miss Morse of Chicago.* Her study of two hundred and ninety-five different strains following the biometric methods of Theobald Smith and Winslow was so thorough and analytical that even if we are on the eve of a revolution in the method of determining the acidity and alkalinity of media, her results must remain as the basis of the scientific classification of this group. A year later Hine† in Great Britain published an article based upon his unpublished thesis of 1906, in which, basing himself upon the study of the biochemistry of seventy-one different cultures of various diphtheroids, he arrived at conclusions very similar to those of Miss Morse.‡

Miss Morse recognized six groups (two groups or sub-groups of *B. diphtheriæ* distinguished by fixed morphological differences, the one less virulent than the other, *B. hofmanni*, *B. xerosis*, *B. hoagii*, and *B. flavidus*); Hine recognized five main groups (*B. diphtheriæ*, *B. hofmanni*, *B. coryzæ segmentosus* (Cautley), a group of skin diphtheroids, and another of urethral diphtheroids.

Last year, Mellon,§ of Harvard Medical School, published the results of another exhaustive study of the group. Employing as many as ten different saccharides, he makes out no less than seven sub-groups of the diphtheroids, or, including *B. diphtheriæ*, eight. Experience must show whether he is justified in making this extensive subdivision. This is not the place to enter fully into the vexed matter of the specific value of fermentation tests. In connexion with this diphtheroid group, as with other groups of pathogenic bacteria, those who have made the fullest and most

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* *Journ. of Inf. Diseases*, 1912, xi, 253.

† *Journ. of Pathology and Bacteriology*, 1913, xviii, 75.

‡ In 1906 (*Journ. of Hygiene*, 1906, vi, 286), and later in 1908, in the well-known volume by Nuttall and himself ("Bacteriology of Diphtheria," p. 161), Graham Smith described and named a considerable number of diphtheroids. He did not, however, make a study of the fermentative activities on a sufficiently extensive scale, so that, willing as we are to credit his pioneer work, it is difficult to place precisely his various species or sub-species. Add to this, by the laws of botanical nomenclature, several of his designations, being trinomial, are inadmissible.

§ *Journ. of Bacteriology*, 1917, ii, 269.

exact studies are most willing to admit the wide variations that occur even in the fermentative activities of strains about whose allocation there can be no reasonable doubt. Thus, for example, Graham Smith has recorded an epidemic of diphtheria in which many of the cultures isolated fermented saccharose vigorously. On the other hand, it has to be admitted that with regard to specific sugars well defined groups in general show a striking constancy in their action. It is, for example, a perfectly sound rule to lay down that a diphtheroid which ferments dextrose, lactose and dextrine, and fails to produce acid with saccharose, is either *B. diphtheriæ*, or what we would term *B. quasi-diphthericus*, the differentiation between the two being made by the inoculation test. However, the converse does not obtain that all diphtheria bacilli ferment these sugars. In an article just published, Smith of Glasgow throws doubt upon the fermentation of lactose by *B. diphtheriæ*.* Only two out of six of his strains, proved by inoculation to be the Klebs-Loeffler organisms, fermented this sugar. Either Glasgow has a special strain of bacilli, or this laboratory an inactive brand of lactose.

And studying carefully the excellent tables compiled by Hoag, Morse and Mellon, we find ourselves justified in selecting for this group the four sugars employed in this investigation. Had we, that is, employed ten, we cannot see that, judged by the experiences of the above-noted observers, we should have at all materially altered our findings. As it is, the permutations and combinations afforded by four variables, or more truly (including virulence) five, are quite sufficient for all reasonable and practical purposes. Species are not so precisely limited. It is well to bear in mind that the separation of forms of life into genera and species is in its essence at most a convention, a convention instituted for the sake of utility, in order to permit the orderly classification of the forms under review. Among these lower forms of life sharply defined species as such do not exist. When, therefore, a classification becomes so minute that in place of being useful it becomes tiresome, the primary object of the convention is defeated. It is contrary to good sense and good practice to elevate a single variation in the fermentation tests into a specific difference. Within the limits of this group the four sugars selected, together with the results of inoculation, or virulence, afford all the particulars necessary for a sound classification. Even these four, in our opinion, are at most helpful, not

* *Applied Bacteriology*, edited by C. H. Browning, M.D., London, 1918, p. 60.

definitive. Diagnosis, that is, cannot be based upon fermentation tests alone.

Employing these and utilizing the data afforded by the investigations above-mentioned, we recognize the following members of the group:

CLASSIFICATION OF THE MEMBERS OF THE DIPHTHERIA GROUP, BASED UPON CULTURAL CHARACTERS, FERMENTATION TESTS AND PRODUCTION OF ECTOTOXINS

	Dextrose	Lactose	Saccharose	Dextrine	Extotoxins
B. enzymicus (Mellon, 1917).....	+	+	+	+	—
B. diphtheriæ (Klebs-Loeffler, 1887)...	+	+	—	+	+
B. quasi-diphthericus (the authors)....	+	+	—	+	—
B. hoagii (Morse, 912).....	+	$\overline{-}$ +	$\frac{+}{-}$	$\overline{-}$ +	—
B. xerosis (Kuschbert & Neisser, 1884).	+	—	+	—	—
B. flavidus (Morse, 1912).....	+	—	—	—	—
B. ruedigeri (Mellon, 1917).....	—	—	—	—	+
B. hofmanni (? Park & Beebe, 1895)..	—	—	—	—	—

Morphologically all the organisms here noted have the peculiar features of the diphtheria bacillus, and may on first sight be mistaken for it. There are a few forms on record which may be mistaken for *B. diphtheriæ*, but ferment sugars with the production of gas. These we do not regard as diphtheroids, but as members of the proteus group, nearly allied. The characteristics of the various sub-groups or species are as follows:

B. enzymicus.—So-called from the strong tendency exhibited to ferment sugars with the production of acid. All the members of the group ferment at least six of the saccharides employed commonly in bacteriological research; some ferment as many as ten. Growth poor when first isolated; individuals vary greatly in size and appearance.

Included in this group are the strains (*B. hodgkini*) isolated by Bunting and others from cases of Hodgkin's disease.

B. diphtheriæ, cultures greyish white, with no pigment production, slightly moist; characteristics so well known that they need not here be recapitulated.

B. quasi-diphthericus.—The separation off of this sub-group is necessitated by the consideration that bacilli which do not cause diphtheria cannot be spoken of as diphtheria bacilli until it is

shown that they are *potential* diphtheria bacilli, that by passage, etc., they can be made to produce ectotoxins. Until this has been done they must be treated as distinct. In every other respect they are not distinguishable from *B. diphtheriæ*.

B. xerosis forms on blood serum agar whitish or colourles: colonies, dry and adherent, growing not very actively, and consists ing of large rather thick individuals with clear-cut segmentations-Neisser's granules large and irregular. Common upon the conjunctiva. Does not ferment lactose or dextrine. There has been considerable confusion regarding forms described under this heading. Mellon, from the study of one strain only, describes it as negative to saccharose, while Hamilton includes a maltose fermenter under this name which Mellon would class as *B. flavidus*. That here given is the more commonly accepted sugar formula, though acid is produced so slowly with dextrose that earlier observers reported the fermentation to be negative. Eyre isolated a form from cases of chalazion which he found pathogenic for guinea-pigs, causing local œdema on inoculation. Other observers find it devoid of virulence, and it does not produce ectotoxins.

B. flavidus.—Morphologically and culturally very similar to the preceding, save that with age *the colonies become pale yellow*. Dry adherent growths on blood and serum media. Neisser's granules large and irregular. While not producing ectotoxins, Hamilton found it pathogenic for guinea-pigs (four out of seven strains). Mellon would give this name to organisms "similar in most respects to the Klebs-Loeffler bacillus, but lacking the specific toxin formation of the latter." Morse lays stress on the fact that, unlike *B. diphtheriæ*, it is a weak fermenter, and that "usually" saccharose, maltose and glycerine are not fermented.

The observations of Captain Adams at Folkestone that the strains isolated there, while giving the sugar formula of *B. xerosis*, nevertheless assumed the yellowish colour which is associated with *B. flavidus*, suggest strongly that Hamilton is correct in admitting a considerable variation in the fermentative activities of the former. But in that case *B. flavidus* as such becomes non-existent, save as a variant of the earlier named *B. xerosis*, and all come under the one heading of *B. xerosis*. We are not prepared to make a decisive ruling on this point, and hence, provisionally, record both forms, although registering an opinion that *B. xerosis*, *B. flavidus* and *B. hoagii* form a closely allied series of forms.

B. hoagii.—Under this heading it appears proper to include a very widely distributed group of non-pathogenic diphtherodis

growing actively on blood media, and giving abundant moist confluent growths which take on a *salmon-pink or tawny colour, becoming buff with age*. They vary in their fermentative activities; in general ferment saccharose actively, and do not ferment lactose and dextrine. Maltose at times fermented, at times not. Individual bacilli of medium size smaller than the members of the two preceding species, but larger than *B. hofmanni*, thick, solid, barred, or wedge-shaped. Neisser's granules abundant but small.

We are of the opinion that Benham's organism* which he obtained from cases of common cold belonged to this group, and not, as Mellon regards it, to the *B. enzymicus* series, and that therefore, by the laws of priority, his name *B. septus* (1906) should be applied to this sub-group, but both Benham and Graham Smith identified their organisms with Cautley's *B. coryzæ segmentosus*, and doing this report fermentative activities so divergent as to create confusion. Hine's skin and urethral diphtheroids are here apparently to be included, the latter fermenting dextrine, the former not.

B. ruedigeri.—Ruediger isolated this organism in 1903. It grows heavily on agar and various media, and causes diffuse clouding of broth. It ferments none of the "sugars," although it decolorizes litmus milk, but this without the production of acid (reduction process). It produces an ectotoxin fatal to guinea-pigs, which is not neutralized by diphtheria antitoxin. Rare.

B. hofmanni.—Small, solid, wedge-shaped forms, smaller than *B. diphtheriæ*. No Neisser's granules. Growths colourless. Ferments none of the sugars. Non-toxic.

This table and these descriptions are, we admit, provisional. More has still to be accomplished in the matter of reciprocal agglutination and complement fixation tests before the relationships by these various sub-groups is clearly determined. We give the table tentatively in the hope that it may be of service to others and form the basis for further work.

Comparing this with the table already given of our results, it will be seen that our Wound Diphtheroids (I) come under the category of *B. enzymicus*, our Wound Diphtheroids (II) are *B. hoagii*, and our Wound Diphtheroids (III) are *B. xerosis*.

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* *British Med. Journ.*, 1906, i, 1023.

Conclusions

1. Morphologically, and in the early stages, culturally, diphtheroid bacilli from wounds are, many of them, indistinguishable from *B. diphtheriæ*.

2. Harmless, non-toxic bacilli may be present in wounds affording cultures possessing the same sugar formula as regards dextrose, lactose, saccharose and dextrine, as does the true virulent Klebs-Loeffler bacillus.

3. It is not justifiable, therefore, to make a diagnosis of diphtherial infection of wounds, either from smears alone or from stained preparations and cultural characteristics.* The demonstration that the bacilli produce toxins—ectotoxins—*i.e.*, the result of inoculation of both cultures, is alone capable of proving the presence of infection by the true virulent *B. diphtheriæ*.

4. By the staining, cultural and fermentation tests, four cases of apparent diphtherial infection have been detected in a careful bacteriological study of three hundred and six cases of open wounds. By the decisive test of inoculation these are reduced to two.

5. There is a large body of evidence showing that even isolated cases of diphtherial infection of wounds are distinctly uncommon among the wounded overseas, and complete absence of any evidence in Great Britain that these isolated cases have acted as foci for the spread of the infection to other wounded men. No evidence of a widespread infection of open wounds by diphtheria bacilli has been discovered in Canadian hospitals overseas in Great Britain.

6. Diphtheroid bacilli of various orders, while not common, are, as might be expected, more frequent in open wounds. There is no evidence that these have exerted deleterious effects.

7. There is a certain amount of evidence that particular species of diphtheroid bacilli characterize particular hospitals.

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* *E.g.*, advice has been received from Canada that a bacteriological examination of the wounds of returned invalids at the time of their leaving the hospital ship on January 10th, 1918, before any of the wounds had been dressed on shore, revealed the presence of "bacteria similar to diphtheria bacilli" in fourteen cases. Further information is promised regarding these cases. The wording of the information indicates that inoculation tests had not at that time been performed.

THE CANCER PROBLEM

By C. H. Mayo, M.D.

Rochester, Minnesota

THROUGH the study of comparative anatomy and embryology the anomalies of life have only recently become easier of explanation. It is shown that each life higher in the scale of evolution is subject to anomalies such as would be normal to some life lower in the scale. Certain additional forms accompany the changes from invertebrate to vertebrate. Within these two groups may be found the explanation for most of the anomalies, the cause in some being a chemical one—a change in the salts of the amniotic fluid, or of the solution in which the egg is developed. Is it not possible that the cancer problem may in time be worked out in all its details on the basis of primitive life? In fact, we advance far by the harmonious assembling of facts made known by many observers and writers.

Unicellular life of both animal and plant type divides the cell and with it the cell intelligence for type and habits. We find that microbes may be changed from one to another of the same species by change in the oxygen tension, showing that variations of these organisms may occur with but little change from natural conditions. The polar bodies, centrosomes, and chromosomes do not occur in the unicellular organisms as found in the cells of multicellular organisms, and while unicellular growth is parasitic, increasing as long as food can be obtained and environment permits, in multicellular life each cell must be controlled for community existence and harmony of work, and the controlling agents are the chromosomes and centrosomes. Probably the centrosome represents the dynamic power as suggested by Wilson.* Cancer is created in some manner by the division of one cell failing to carry with it the

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Presented before the Ontario Medical Association, May 29th, 30th and 31st, 1918, at Hamilton, Ont.

* Wilson, E. B.: "The cell in development and inheritance." New York, Macmillan, 1911, 483 pp.

centrosome, the next division leaves it without control as a unicellular type of life capable of lawless growth more or less true to type but without a controlling brain. In reversion of type, the cell becomes parasitic in existence, creating nests of cells, fungating growth, ulceration and degeneration or connective tissue, according to the location, tissue and blood supply and reaction to irritation, and primarily changing the local field into a slightly acid one as an environment suitable for its growth. Ultimately this fluid permeates the body, a curious cancer cachexia occurs and with it there may be metastases later becoming manifest by growth at any point where cells may be carried. Before this it occurs in adjacent local lymph glands permeated by the fluid, and cancer grows freely in them. It is this need for proper chemical fluid environment that explains why cancer cannot be transmitted into higher types of life, but can be transmitted in the lower. This explains the metastases occurring in cachexia, the whole body being in an acceptable fluid state.

Cancer continues to be one of the greatest of modern scourges. The disease apparently is on the increase, especially among the more highly civilized races. It may possibly be more prevalent than is suspected among lower types of the human race because of lack of examination and investigation, as has been shown to be the case in cancer of animals such as water buffalo, dogs, chickens and mice and the lower types of life. In this connexion, Erwin Smith's work on cancer in plant life is of great interest, He has shown many plant tumors as being due to bacteria and insect irritation, and he has been able to reproduce and transplant certain tumors which compare in malignancy with those of animal cells. He also predicts almost the localizing of the cancer by use of certain irritants injected with the cancer cells.

In cancer there is a local lawless cell growth. There must be, then, either a local cell fertilizing agent or a local loss of control over cell growth, and the study becomes one of the individual cell, the actions of which are best observed in early cell life. After maturity is reached, there are few structures capable of cell growth, yet the thyroid, a dynamic organ controlling energy output, is subject to hyperplasia, the liver, a most necessary organ, is subject to regenerative growth.

Discussion, investigation and discovery have been the means of controlling other great life-destroying diseases and have been most helpful in the control of cancer. Statistics show a marvellous improvement in the control and care of tuberculosis, and of pneu-

monia, while cancer, apoplexy, nephritis, and diseases of the heart have all been increasing. The greatest advance, however, in our knowledge of disease has come from a study of the individual cell. MacCarty's investigations tend to show that the disease begins in the waiting or immature repair cells, which replace the active or protective epithelium of the secreting cells, and not in the mature cells. The necessity for over-activity of these resting cells by the stimulation of continued traumatism and the destruction of mature cells may be an important factor in the local origin of cancer. Thus rapid development and lack of control with migratory hyperplasia would place such cells within the cancer classification. The cell's intelligence for growth carries on progressive activity; the half of each active cell becomes the new cell continuing its intelligence. Some investigators believe that a fertilizing agent of nucleated cells gains entrance to local areas through traumatism, and should a single cell become fertilized, cancer may develop. It is believed by some that the fertilizing agent of a cell is water-borne, and with some stretch of the imagination we bridge provoking difficulties of type, form and location in a study of the cause of cancer. The biochemic theories of cell development are also advanced. The effect of cholesterol on the cell is being investigated. Educational propaganda has been of incalculable value in the prevention of cancer by early treatment, by the removal of benign tumors, and by the avoidance of irritation. It is probable that there are continually two hundred thousand people in this country suffering from the disease, and approximately eighty thousand die each year of the disease.

While cancer may be found at any age, it does not commonly occur in persons under thirty-five years and it rarely occurs in persons under twenty years, when natural cell activity might be presumed to be a factor, and its disturbance would more readily develop uncontrolled growth. The resistent influence of youth may lie in the rapid reduction and restoration to normal of the acidity necessary to remove the ashes and waste developed in cell activity, and young cells have not exhausted the protoplasmic control bodies. In old age with hardening of the tissues, it is easier for a centrosome to be immature in its development and it may wholly fail. If it is immature, we have the skin changes, and, in the old precancerous conditions, becoming cancerous when one cell utterly fails in its control. Thus cancer would originate in one cell reverting to primitive life. The chemical change is naturally much slower in degenerating tissue or in the normal degeneration of advancing age.

In considering this chemical theory of cancer as influencing vicious cell growth, it is noted that one-third of the cancers affecting man, 38 per cent. in men and 22 per cent. in women, are found where acidity is constant and high, as compared with other tissues such as in the stomach. In ulcer, the gastric secretion is high in free acid. When cancer develops, combined acids increase and free acid diminishes or disappears, and the activity of pepsin is reduced or destroyed, regardless of the presence of combined acids. In accordance with this hypothesis peptic ulcer and cancer would occur but rarely in the non-acid achlorhydric stomach, since destructive growths and destructive bacteria are most harmful in the acid environment. The duodenum, which by right of continuity of tissue and close association, and opportunity for grafting from cancer in the stomach, is far more commonly affected by ulceration than is the stomach, but it is rarely affected by cancer, which, nevertheless, may spread from the stomach into all other tissues and structures surrounding it and at distant points in the abdomen. Ulcers occur in the stomach about one third as frequently as in the first portion of the duodenum. A large percentage of gastric cancers give a history of preceding ulcer. Ulcer, then, is more common in the naturally alkaline duodenum, which is periodically bathed with the acids from the stomach. The neutralizing process occurs in the first portion of the duodenum. Ulcer or cancer is very rare in the duodenum below the first two or three inches, although cancer occasionally occurs in this organ by penetrating through a duct. Cancer occurs but two times in the whole length of the alkaline small intestine to ninety-eight times in the large bowel. The colon is frequently affected by cancer because here again there is acidity, and 75 per cent. of cancers are located in the fixed and tissue-surrounded portion of the colon, which retains the dry and harder contents as a traumatic agent. The same statement may be made concerning the development of cancer in other fields, either normal or degenerative, that is, the urinary bladder, the cervix and the mouth. The mammary gland, the uterus and the prostate are subject to carcinoma, being tissues in which degeneration is a normal process and having but a limited period of functional activity.

Ulceration, under proper conditions, may permit cancer to develop. The ulcerative process itself is usually of bacterial origin, and the bacteria are carried by the circulation, local conditions of infection being developed through capillary infarctions. It is very probable that the essential factor in the development of carcinoma is a derangement inside of the single cell, in an acid field and that

the single cell carried through the lymphatics or into the circulation is the cause of metastasis. In the peritoneum and on the surface, grafting is common and it is occasionally seen in epithelial and mucous surfaces.

It is evident that cancer is on the increase among the more highly civilized people; the enormous percentage occurring in the stomach would indicate that this organ receives the greatest abuse. Many factors concerned with the higher civilized existence probably tend to the increase of cancer and should be a subject for study.

We have then in cancer a cell with lost control, destroying its community existence and reverting back to primitive life. It has a natural acid environment or an acquired one incident to local degeneration which may be normal, as in the stomach, or incident to normal degeneration as in the breast and uterus, or the degeneration of age.

The part played by chronic traumatism or irritation in the development of cancer is positive and definite to a degree. The danger of cancer is increased by all irritation or traumatism which demands a continued cell repair and it is in proportion to that demand. Ultimately exhaustion of cell control bodies occurs, modified by age limitations and chemical surroundings. Such areas offer an increasing opportunity for the half of a dividing cell to revert to the unicellular outlaw type of life and to become parasitic and cancerous.

If the cells are involved they must be of the immature or waiting type, and further progress in the study of cancer can come only through a study of the individual cell of the multicellular and unicellular organisms, in order to select more definitely the one or more bodies which may be involved in the control of its protoplasm.

Treatment

Removal by any method is effective, if early, whether by knife, paste, cautery, rays or radium. Removal of the local growth is not effective if the glands are involved, more extensive dissection being required in addition to gland removal.

The effect of rays may be to lower the permanency of the control bodies of the cell; thus prolonged *x*-ray treatment without protective shields, for certain types of rays, adds a factor of danger in the production of cancer.

THE SOCIOLOGIC AND ECONOMIC ASPECTS OF TUBERCULOSIS

By J. S. Wright, M.D.

Edmonton, Alberta

THE Armegeddon that has been convulsing Europe for the past three years, and that has drawn this country into its vortex, has, I fear, temporarily withdrawn the minds of people from the ever-present ravages of tuberculosis, and that at a time when the people of this Dominion should be facing the problem with greater vigour and vigilance than ever, because of the increased demands that will be made upon our efforts and resources with the return of the armies from overseas. It is true that the Hospital Commission has anticipated this demand, and has made certain provisions to meet it, but this in no way affects the cases in civil life at present with us, nor those that will seek homes in this country after the war.

The average citizen is appalled at the terrible destruction of life on the battlefields of to-day, and, indeed, would be a callous individual were he not so moved, but the same citizen gives but a passing glance at, or makes but a casual remark about, the destruction of life by this terrible plague, and passes on, oblivious to the fact that it destroys more lives every decade than the bloodiest wars have ever done. The very frequency of such destruction of life, and the distress accompanying it, has dulled our sensibility in estimating the destructive forces, and benumbed our sense of responsibility in the prosecution of this war that will still be with us when the present European strife will have become ancient history.

The sociologic and economic aspect of this question is far-reaching, ramifying as it does into every phase of the social and industrial life of the nation, embracing alike the factory and the home; the office and the college; the mansion of the wealthy and the cottage of the poor; insidiously attacking the workman at his bench; the accountant at his desk; the student in his classes; and the indi-

Read at the forty-eight annual meeting of the Canadian Medical Association, Montreal, June 13th, 1917.

vidual of leisure, surrounded by all the luxuries of the modern homes of the wealthy.

Nor is any age of mankind immune. It may attack the infant not yet released from its mother's arms; the child at play, the youth in the school; the adult in the prime of life and busy with life's vocations; or the aged, who, after the activities of life, look forward to some years of leisure before the final summons.

The last quarter of a century has thrown light upon much the nature of the infection, and has placed it positively in the list of communicable diseases, but it has also placed it positively in the list of preventable diseases. The fact that the nature of the infection is known has, *per se*, supplied us with knowledge how to escape that infection.

Notwithstanding all this, the indifference with which the general public regard this plague is appalling. Where, then, lies the responsibility for this attitude. We certainly cannot place it upon the shoulders of the members of the medical profession, who have done such titanic work in endeavouring to arouse the public mind to a true appreciation of the causes and effects of this dread disease, but that their effort has not met with a full measure of success is only too apparent, if we but glance at the health reports of our cities and provinces.

Neither can we lay the responsibility at the door of that splendid body of men and women who banded themselves into the Society for the Prevention and Cure of Tuberculosis, and who, by the sacrifice of time and money, have carried on a campaign of education along these lines. Their efforts, like those of the medical profession, have not met with a full measure of success; but who would presume to place an estimate upon what these two bodies have already done, or to say what the future results will be?

The responsibility I lay, and that without hesitation, primarily, at the door of the State, and secondly, at the indifference of the public.

No expenditure of public funds, if wisely made, will yield such dividends as that expended on public health; dividends of actual cash, because with the maximum degree of public health co-exists the maximum degree of industrial efficiency; and what is of still greater value is the dividend of contentment and happiness in the individual and the home.

From the dollar viewpoint alone, let us glance at the monetary cost, annually, to the Dominion from tuberculosis.

Dr. Bryce, in his address to the Canadian Association for the

Prevention of Tuberculosis, meeting in the city of Quebec, 1916, made the statement that ten thousand died annually from tuberculosis in Canada. Placing the value of the individual to the State at $5,000 (and this seems to be the value placed upon the life of the individual by the courts), means an actual loss to the country of fifty millions annually.

Nor is this all. With every ten thousand that die from the disease, one hundred thousand are afflicted with it. From statistics that I will quote later, this means a further loss annually of forty-five millions of dollars, placing the average earning capacity of the individual, between the ages of twenty and sixty, at $2.00 per day—a very low average. Nor is this all. The one hundred thousand sick must be cared for, and that cannot be done without actual dollars. The cost per patient, per day, cared for in the hospitals of Canada, varies from about $1.50 to over $2.00. Taking the lowest figure, we have another fifty millions, annually, actually lost to the Dominion of Canada from this disease alone. These figures are appalling, and you know, gentlemen, that figures cannot lie, although some liars may figure, but the writer denies any relation, whatever, with the Ananias Club.

According to the Bertillon Classification, one thousand deaths from tuberculosis are divided, per age, as follows:

From 1 to 20 years, number of deaths..... 184
From 21 to 40 years, number of deaths..... 448
From 41 to 60 years, number of deaths..... 313
From 61 years and over, number of deaths..... 55

Or twenty to sixty years—76·1 per cent.

Children and youths to the age of twenty are, generally speaking, non-producers, and are dependent either upon the state, their guardians, or their parents for their upbringing and education, but these same persons, during the next two decades, are the producers, both of national wealth and of the species, and cannot be eliminated without loss to the state. The next two decades, from twenty to forty, is the period of life in which the species is being reproduced. During this period, 44·8 per cent. of all deaths from tuberculosis occurs, and over 90 per cent. of all children are born from parents between these ages.

The Bertillon Classification corresponds very closely with the vital statistics of the various provinces of the Dominion.

In the province of Alberta, the death-rate between the ages of twenty-five and forty-four inclusive, in 1915, was 40·8 per cent.

of the total death-rate from tuberculosis, and the total deaths in the same year from the disease was 8.5 per cent. of the total death rate of the province. These percentages speak for themselves and constitute an eloquent plea for a renewal of our efforts, or, rather, a renewed determination in prosecuting the war against the disease.

Until the present, the burden of this fight has been borne by but two bodies, the medical profession and the Association for the Prevention of Tuberculosis. It is true that the efforts of these two bodies have not yet reached the pinnacle of their aspirations, but it is, nevertheless, true that their course is ever upward, and that the true estimate of what has already been done is a matter of the future and not of the present. Has the time not arrived when this burden should be shared by the higher authorities. The Dominion Government and the governments of the different provinces have a responsibility in this matter that has been too long shirked. It is true that from time to time different measures have been enacted both by the Dominion and provincial bodies which have helped very materially in prosecuting this fight, and that certain monetary assistance has been given, but with these apparently their efforts end. This is not as it should be, and until the governments of this country awake to their responsibilities in this matter, the results obtained will be far short of those desired. The sanatorium is now the recognized place for the treatment of this disease, in whatever state, and their existence is amply justified by the results obtained. That these institutions should have to struggle along, dependent upon the generosity of the individual, seems to me to be very wrong indeed. These institutions should be built, equipped and maintained at the public expense, and until this is done the efforts of the Association for the Prevention of Tuberculosis will not have accomplished its purpose—the stamping out of tuberculosis.

A deputation that waited upon our provincial premier and advanced these ideas, was courteously received, but we were plainly told that the government could not see its way clear to act on the suggestion. It was pointed out to us that no other province was undertaking the work.

In the province of Alberta, the public health is administered through the Department of Agriculture, and takes second place to the killing of noxious weeds and gophers, to the health and happiness of our horses, our cattle, our hopes, and even of our hens. Should any of these be sick, a paid provincial veterinarian will travel the length and breadth of the land to see them and cure their ills. But the poor man or woman afflicted with tuberculosis, or,

in fact, any other disease, must pay for advice or go without it, unless it be that some physician, out of kindness, renders such aid, which usually occurs.

If the figures quoted be correct, and they are assuredly reasonable, does it not appeal to you as exceedingly poor business that this loss should occur annually, when a percentage of the annual loss expended in the construction and maintenance of a series of sanatoria, extending from the Atlantic to the Pacific, would ultimately wipe out the loss and place the figures on the other side of the ledger.

Further, such a series of sanatoria maintained by the Dominion and provincial governments, co-operatng on some plan that could easily be worked out, would give much more efficient control of existing cases, which is so necessary in the extermination of the disease. Then there could be a rigid segregation of all individuals that are a menace to others. These cases would become the guests of the government until they were either dead or better, and in the meantime would be prevented from passing the disease on to others. Personally, I have held very positive opinions on this phase of the question for a number of years, and believe that the disease will never be exterminated so long as sentiment influences our operations.

In Ontario, at the beginning of the present century, when there were no special facilities for the care of tuberculosis patients, they had a death-rate of 1·4 per thousand. In the year 1900, the Anti-Tuberculosis Society was organized, and in the fourteen years following, when their sanatoria accommodation had increased from none to twelve hundred beds, their death-rate per thousand fell to 8 per cent., the lowest rate of any of the provinces. These figures are significant in establishing a ratio between efficient and sufficient sanatorium accommodation and the death rate from tuberculosis.

This, then, should be sufficient plea for great sanatorium accommodation, and sufficient reason for the Anti-Tuberculosis Association and the medical profession persisting in their pressing upon the Dominion and provincial governments their obligations and responsibilities in the matter, and not slackening in our demands until we see a string of sanatoria from Prince Edward Island to British Columbia, state-owned and state-operated, in which those unfortunates may find a haven without being a worry to themselves and a burden to their friends.

This association and the medical profession throughout the civilized world, possess a power to-day that it has never held before in the history of medicine.

The man behind the man behind the throne—Lord Northcliff—made the sweeping statement that, at the beginning of the war, the only department of the service that was up to its maximum degree of efficiency was the Army Medical Corps, and this fact has been growing and sinking into the public mind more and more as the war progresses. The profession is coming into its own, and to-day can be, and should be, a large factor in moulding public opinion especially in matters of public health.

Governments are but the expression of public opinion—and as such are not beyond the sphere of influence of the profession.

Let the legislative committee of this association see to it that a department of public health—Dominion wide—is organized and made a part of the government, with a commissioner at its head, who shall be a recognized authority on matters of public health and sanitation. This department should be placed above party politics and established on such a basis that the political boss, or ward politician, could not interfere with the commissioner in carrying on the work of his department.

Let the legislative committee of the different provincial societies see to it that a similar plan is worked out for each province, and the administration of the health laws is taken out of some other department where they are but a side, issue, and raised to the dignity of a department of the government, with a commissioner of health at the head, with similar qualifications and holding office under the same conditions as suggested for the Dominion government. These heads of departments, together with the medical health officers of the cities and towns, meeting annually, would exercise a tremendous influence on public opinion, would speak with authority on matters of health, and, I venture to say, would soon justify their existence by the results obtained.

THE RETURNED SOLDIER

By W. T. Connell, *Lieut.-Col., A.M.C.*

Queen's Military Hospital, Kingston, Ont.

THIS paper deals only with certain aspects of the problems of the soldier, rendered ineffective by wounds, injury, or disease, and now being returned to this country.

Such men fall into two main groups: (1) those returned whose medical treatment is complete, but whose disabilities are such that they are deemed to be ineffective for duty at the front or on lines of communication. Such men are returned and, if needed and suitable, are retained for base duty in Special Service companies; if not needed, they are sent before a medical board, disabilities graded and men discharged to civil life. (2) Those returned who still require more or less medical treatment. This is the group with which we have to deal in hospital work in this country and with whose problems I am familiar. Roughly we divide these cases into cot and convalescent groups. The former constitute those cases of crippling injuries, or disease severe enough to make the recumbent position desirable. So far these cases constitute from one fifth to one fourth of our population. They differ only in the severity of their disability from the convalescent group and on this account have to be detained in hospital on arrival in Canada. The convalescent or walk ing cases are all naturally anxious to get to their homes and see their families. On admission these men are at once submitted to an examination and all those who will take no harm are granted two weeks' home leave. Applications for extension of leave are of course frequent, but are only given in special cases. On return to hospital these men are re-examined, a case history sheet written up to date, and the man is referred to medical, surgical or specialist consultant, as his case may require, and treatment outlined is put into effect.

Surgical Cases. Thus, if the case is a surgical one, the consultant looks the patient over with the medical officer and outlines procedure. Such a man usually requires an *x*-ray examination and

Read before the Kingston and Frontenac Medical Society, April 8th, 1918.

may need some remedial operation, a special boot or mechanical appliance, remedial exercise, massage, or physio-therapeutical treatment, and these a convalescent hospital should be in a position to furnish. The operative work required is of heterogenous nature, but consists mainly in the removal of portions of dead bone or other foreign material, including shrapnel, the curettement of sinuses, tendon transplantation, an occasional bone plating, a larger number of bone grafting operations, a few osteotomies, and considerable plaster work. Major operations are occasionally necessary, such as amputations, or re-amputations, cystotomy for stone, appendix operations, etc. The services of a surgeon with a fairly good orthopædic knowledge is thus very essential. A first-class *x*-ray equipment and operator is an absolute essential and these we are fortunate in having.

Our hospital has two shoemakers to make special boots, pads, binders and belts and to line braces and mechanical appliances. We have been fortunate in securing the services of a shoemaker with considerable experience in this line of work, and who can readily follow specifications, and thus his work is proving very satisfactory. A machinist makes the necessary mechanical appliances on our specifications; as he has been able to use the University workshops, we have been spared the expense of equipment.

We have utilized the services of the physical instructor attached to this hospital for the carrying out of special remedial exercises. A course of exercises is devised for each case where muscles require development and in which there is pseudo-ankylosis from fibrous thickening, or from disuse. These exercises are graded and have been of great advantage in many cases. This work is a very promising field in the case of men whose disabilities are much exaggerated by disuse of limbs, or muscle groups, and who require re-education.

Massage and passive movements are extensively employed and we have a staff of five masseuses employed. As a preliminary to physical exercises, massage is a very valuable procedure. It can also be employed to advantage in many of the bed cases, where remedial exercises are not possible. Our hospital has, too, most of the usual electrical appliances. Under the direction of Major Quigley these are now being much used. Personally I cannot speak of the indications for their employment except the use of high frequency currents to lessen the pain of hypersensitive tissues such as result from irritation of nerves caught in scars, etc. We are using, too, quite freely various apparatus for the local application of heat, especially in myalgias and chronic rheumatism. On these I

cannot yet express a definite opinion as to their field of usefulness.

We are not equipped to supply artificial limbs, or special orthopædic apparatus, nor have we attempted to do arthroplasties for bony ankylosis of the large joints. All such cases are transerred to the Special Orthopædic Hospital, Toronto.

Medical Cases. In a similar way on the medical side the patient, after examination, is placed on special medicine, diet, massage, etc. We have had a considerable number of cases returned with persistent albuminuria, following trench nephritis. Under the functional nephritic test very few of these cases show any damage to the general functional capacity of the kidneys. We are continuing our observations on these cases and hope to get more extensive data on which to base conclusions.

A fair number, too, of cases with persistent bronchitis are returned. In younger subjects many of these (with no history of gassing), are cases with a tuberculous basis. As a rule these cases respond quickly to treatment in this climate. Any definitely tubercular case is at once transferred to the sanitorium and passes from our care. In men over forty the response to treatment is poor, as the lungs are usually emphysematous.

Shell Shock and Neurasthenia. A certain number of these cases are returned. As a class they are not suitable for treatment in a general hospital, but require special care and treatment. It has been our practice to clear all, except the lighter cases, to the Cobourg Military Hospital, which is staffed and equipped to deal with this class of cases. A a rule these cases clear up in time, but are certainly unfitted for further military service, except in clerical or light orderly duties. They do much better in civilian life, as there can be no question that the fear of return to active service militates strongly against recovery.

The bacteriologist looks after the Wassermann reactions, special bacteriological blood and urine examinations and the manufacture of autogenous vaccines. The medical officers of wards are responsible for the simple laboratory procedures as blood and urine analyses.

All eye, ear and throat cases receive the attention of a specialist, and glasses, artificial eyes, etc., are supplied on his prescription.

Sooner or later, the man reaches the stage when it is considered that further treatment will not be of advantage to him. The medical officer in charge of the man then writes up his case on M. F. B. 227, laying stress on the description of the present disability of the patient in so far as function is concerned. This description

should be a fair guage of the incapacity of the man to carry on work, not as based on his previous employment but on the extent to which the man is incapacitated in the common labour market. The medical board in turn examine the man, place him in a medical category and submit their opinion on the disposition of the man.

Medical Boards. Up to recent date the medical officers have given a percentage estimation of the extent to which a man was disabled based on the instructions and table of incapacities laid down by Board of Pension Commissioners. Recently the Board of Pension Commissioners have issued new instructions which take away this duty from the Medical Board. The following extracts are given from such recent instructions:

"The Board of Pension Commissioners represents that difficulty has arisen in certain cases by reason of a difference of opinion between the medical officers of the Pension Board and the Medical Boards preparing M. F. B. 227 in the districts, with reference to the percentage of disability resulting, in the opinion of the medical board, from the present disability and condition of the man who has been examined. The Board of Pension Commissioners comment as follows upon the situation:

"This board has a very competent staff of medical officers whose main duty it has been, ever since the organization of this board, to estimate disabilities and establish medical precedents. The standing medical boards, on the other hand, have, in general, not been mainly occupied with estimating disabilities and, furthermore, they have not had sufficient experience of disabilities to be able to establish medical precedents. It is true that the unification of estimates has been partially secured by the issuance to the standing medical boards of the Board of Pension Commissioners 'Instructions and table of disabilities for the guidance of physicians and surgeons making medical examinations for pension purposes'. It would appear, however, that in all those cases where any great range of estimates is possible no unification of estimates has been secured. For example, one board will estimate the percentage of a disability at as much as 75 per cent., while another board, in a different town, will estimate the same disability at 10 per cent.

"It is the description of the disability and not the estimate of its percentage which mainly interests the Board of Pension Commissioners. If the description of the disability warrants only a 30 per cent. and the estimate of the disability is 50 per cent., a 30 per cent. pension only will be awarded. In other words, the estimate made by the standing medical board merely acts as a check on their

description of a disability and as a possible check on the estimate to be given by the Board of Pension Commissioners. The estimate of the standing medical board is only an opinion. The èstimate of the Board of Pension Commissioners is a decision.

"All reference, therefore, to estimates of the percentage of disability are to be omitted in future, and the medical officer bringing forward the case and the medical board examining for discharge will be instructed to this effect, and required to concentrate upon giving the fullest possible description of the history and present condition of the man."

Now the comments of the Board of Pension Commissioners are of course wide open to criticism. The most obvious, when one is dealing with the case of a man examined and presented by a competent Medical Board, is that the Board of Pension Commissioners is of the opinion that its medical officers are more competent to estimate disability from the written evidence than is a medical board from the evidence and from the facts elicited from the presence and the examination of the case. In other words, the claim is made that the picture painted by the medical officers on the medical board can be better interpreted by the officers of the Board of Pension Commissioners than by the men who painted the picture and had the copy before them. Our medical officers on boards will have to burnish up their descriptive powers so that the picture painted will be vividly presented to these judges.

Our experience is that these judges make mistakes like their confrères on the judicial bench, or ordinary mortals. Of course, however, such decisions are not like the laws of the Medes and Persians, but are subject to review at the end of six and twelve months and yearly thereafter, so that sooner or later, justice is done.

On completion of the Board, papers are forwarded to the A.D. M.S. of the district for approval, thence to District Dépôt (Casualties) for completion of discharge and to Board of Pension Commissioners for pension. Discharge is usually effected in about two weeks, which is of course too short a period for the Pension Commissioners to announce their decision. The man, however, suffers no financial disability, as he is paid at army rates for three months after discharge (post-discharge pay). This, too, affords ample time for the Pension Commissioners to reach a decision and put the man on pension.

Now the medical officers in charge of hospitals are not made acquainted with the decisions of the Commissioners, hence we never know the extent to which our views and those of the medical board

are carried into effect. We are thus not given the opportunity to learn anything from such decisions for future guidance, Many of the men who are dissatisfied with the decisions naturally enough lay the blame on the medical board, believing that they understated or underestimated their disabilities, and thus we not infrequently get blame which we do not deserve.

As to the men themselves, in their relationship as patients, I have but to say that the vast majority can be classed as good patients, co-operating with doctor and nurse and doing all in their power to help themselves on the road to recovery. A few, not over 10 per cent., are grousers, complaining of the line of treatment or the lack of it; or stating how much better it was done somewhere else. As a rule, the men who complain most, deserve least consideration, on the basis of service rendered the country. In this class, too, are comprised those who stir up the sympathies of the sentimentalists found in every community and these, in turn, do not make the lives of officials any easier. Of course these sentimentalists do keep medical officers and other officials attentive to their duties, by calling attention to any apparent dereliction of duty. We object most strenuously to that class of sentimentalist who encourage in those who don't need such encouragement the view that the country owes him a living for the future. Public sentiment in this regard is in a healthier state now than a year ago, and I think continued improvement in this regard can be expected. Public sentiment rightly demands that the returned man should receive fair and generous treatment, and this I think is the attitude taken by practically all medical officers.

One source of trouble, both to hospital officers and no doubt to Headquarters' officials as well, are the certificates given by kindly family physicians. Such men too often, out of goodness of heart, sign statements which some investigation on their part would show were, if not erroneous, decidedly misleading. (Several local examples, in which prominent physicians have signed statements which a little more care on their part would have shown were contrary to the facts, were quoted.) I would ask physicians to remember that most medical officers in charge of soldiers have the interests of these men quite as much at heart, as the physician has for his patients—in ordinary practice.

What steps can be taken should a discharged man develop later a disability, traceable to service? In such a case the practice heretofore was that such a man could appeal to the A.D.M.S. for examination and investigation of his case. If the facts warranted

it, such a man is re-attested for purposes of treatment and sent into hospital. As matters stand now, this duty of re-attestation and treatment of discharged men will be assumed by the Invalided Soldiers' Commission. Any deserving case is sure of proper consideration and care.

There is another phase of the returned soldier problem that is of great economic importance, viz.: the question of vocational training. This is particularly important in the case of men whose disabilities are such that they will be unable to again take up the work in which they were engaged before enlistment. A certain number of men during their convalescence are fitted to take up such training and when it has not interfered with treatment we have encouraged such. Naturally we think the restoration to health takes first place. Up to the present time the courses available locally, apart from motor mechanics, have been largely "book-work", covering commercial and civil service courses, with improvement courses in primary education. No attempt has been made by the Vocational Staff to develop the therapeutic workshop idea, or to co-operate with us in this line of work. In consequence, we have had to substitute special exercises under the physical instructor, with supervision by the medical officers. After discharge, of course, a man can take up vocational work directly under control of the vocational staff. The principle is an excellent one and needs development on business lines.

Venereal Problem. Among the people of this country there seems to be a widespread opinion that venereal disease constitutes one of the main problems of the army in general, and returned men in particular. It is true that these diseases are prevalent in the army, but not to any greater extent than in the civilian population. In the army the ineffectiveness caused by these diseases is made manifest, the cases are discovered and subjected to treatment and the hospital returns show their prevalence. In civilian life infected individuals' working inefficiency is covered by "absence through illness"—no statistics are available as to its exact prevalence, and no systematic treatment is enforced. In fact, the great reservoir of infection is the civilian population. One gets a good idea of its prevalence from the results of examination of the draftees under the Military Service Act. When these men were called up and subjected to examination on reporting to their dépôt, the venereal hospital became filled to overflowing and its capacity had to be more than doubled. Venereal diseases are a civilian problem more than an army one. In fact, as far as the returned man is concerned, there

is no such problem. All men before leaving England are examined and certified to be free from such disease. On return, if a man has had a history of venereal disease on his medical history sheet, or if there is any indication of syphilis in his clinical history, a Wassermann test is done, and, if necessary, a full course of treatment carried out. As a result returned men will practically be free from venereal infection on discharge, and instead of a menace to the civilian population, will be menaced by the latter.

The first hospital for American soldiers has been lately opened in Liverpool. All other hospitals in Britain have been for American officers. The hospital is known as American Red Cross military hospital No. 4, and is situated in the Mossley Hill district. Already many American soldiers occupy its cheerful wards. The hospital proper occupies Mossley House, the former home of Dr. Edmund Knowles Muspratt, a noted authority on chemistry, and one of Liverpool's leading citizens, who, when he heard that the Americans wanted it, gladly turned it over to them. The house stands in the centre of seven acres of beautiful grounds, the flowered gardens of which are rapidly being converted into plots of rising vegetables. An American flag, flying from the tall staff in the front of the grounds, points the way to visitors.

The largest American hospital in England will be located at Salisbury. It will accommodate three thousand wounded Americans from the Western front.

THE TREATMENT OF INFECTED WOUNDS WITH DICHLORAMINE-T WITH SPECIAL REFERENCE TO ITS ADVANTAGES OVER THE CARREL-DAKIN METHOD

By Herbert W. Baker, B.A, M.B.

Toronto

THE subject of the treatment of infected wounds is one that has probably excited more interest than any other among the medical profession since the war began. Many methods of treatment have been devised, tried out, and cast aside. Probably no part of our pre-war teaching has changed as much as this question of antiseptics. We formerly used bichloride of mercury, carbolic acid, lysol, boracic, etc., believing more or less that they killed micro-organisms under all conditions, but now we know that they are antiseptics, that is, they inhibit the reproduction of bacteria, but they are not germicides unless used in strong solutions under favourable circumstances. The perfect germicide is one that will destroy bacteria without injuring the body cells. None of the pre-war antiseptics came up to this standard. Dr. H. D. Dakin, probably more than any other, has done much laboratory work in antiseptics, and in general terms he gives us the following results:[1]

Using a growth of staphylococcus aureus in blood serum-muscle extract medium he found that

mercuric chloride, 1-10 per cent., did not disinfect in three hours, but did in twenty-four;

silver nitrate, 1 per cent., did not disinfect in twenty-four hours;

argyrol, 15 per cent., did not disinfect in six hours, but did in twenty-four;

zinc chloride, 3 per cent., did not disinfect in twenty-four hours;

hydrogen peroxide, 2·89 per cent., did not disinfect in twenty-four hours;

phenol, 2 per cent., did not disinfect in twenty-four hours.

Read before the Surgical Section, Academy of Medicine, Toronto, April 16th, 1918.

Dye antiseptics:

malachite green, 0·3 per cent., did not kill in forty-eight hours;

acriflavine, 0.3 per cent., did not kill in six hours, but did in twenty-four.

proflavine, 0·3 per cent., did not kill in twenty-four hours.

So we see that our old favourites are gradually losing their stand.

In the laboratories established at Compeigne by the Rockefeller Foundation in the fall of 1914, Dr. Henry D. Dakin, of New York, examined about two hundred substances known, or thought to be, antiseptics, and finally came to the conclusion that chlorine compounds were the best germicides. Labarraque's solution, known and used for many years, was a very efficient antiseptic, but owing to its high alkalinity causing irritation, it could not be used on the tissues continuously. Dakin reduced this alkalinity with boric acid, and as a result obtained a solution that did not irritate the open tissues. This solution soon became known as "Dakin's Solution". It is an aqueous mixture of sodium hypochlorite between ·45 per cent. and ·50 per cent. in strength. Dr. Alexis Carrel, who was associated with Dakin in his work in France, devised a means of using this solution to the best advantage. The wound was opened widely in such a manner that it formed a well, and small perforated tubes were placed in such positions that the Dakin's solution injected through them would reach every crevice of the wound. These tubes were linked together and from a reservoir suspended above the bed, the solution was run into the wound every two hours, day and night. The results, when all the technique of the treatment is properly carried out, are striking, badly infected wounds being sterilized in a few days. Carrel, Depage and others have reported many cases where wounds of all kinds have been sterilized and secondary suture done with success, but, as Carrel himself says, "The indifferent success that many have had is because of their failure to grasp and apply the details of the technique."

In order to carry out this treatment the assistants must be specially trained. The house surgeon doing the dressings must know the details perfectly; the nurses who assist him and who inject the Dakin's solution every two hours must also be specially trained. All those who have had success with this treatment agree on these points. In a general hospital where the nurses are changed fre-

quently, such a procedure is impossible. Here then is the first place the technique may fall down.

At the Rockefeller Institute, where Carrel is at present training American army surgeons, I spent ten days in their laboratories and wards. The house surgeon, a trained man, had four or five nurses and an orderly to assist him with the dressings. He took about two hours to do fifteen dressings. Considerably more than half of that time was spent in preparing the surrounding skin with vaseline or vaselined gauze in order to prevent irritation. In spite of this preparation I saw several cases where the skin had been more or less "burned" by the solution. Without this care, serious results may obtain. Probably the most important part of the Carrel technique deals with the protection of the skin from the irritation of the solution.

It is essential at the primary operation to prepare the wound so that it will act as a well to hold the antiseptic solution. Thus the first principle of surgery of infections, dependent drainage, is abandoned. If at any time during the repair of the wound, the technique should break down, such as breakage of apparatus or failure in the supply of solution, these wounds act as pus pockets and the results to the patient may be disastrous. Again, when the wound has been sterilized, if it is impracticable to suture it, there is a basin left which fills with pus and, as is well known, many such wounds will not heal as rapidly because there is not dependent or continuous drainage.

Dakin's solution is very unstable. In order that it may be strongly enough antiseptic it must have over ·45 per cent. of active chlorine present, and that it may not irritate the tissues, it must be less than 0·5 per cent. The solution, therefore, must be made accurately and at the most every second day. Moreover, the alkalinity must be reduced almost to neutrality. Owing to instability, this alkalinity tends to increase, and therefore the solution must be tested by titration and phenolphthalein daily. Only those who have done this work and kept a ward supplied with Dakin's solution can realize the time and care it takes.

Another problem that is becoming more important every day is the amount of dressing material used. With the price of gauze and cotton soaring we must do all in our power to save. The Carrel technique needs more cotton pads than any other kind of dressing, because of the quantity of solution that is injected into the wound twelve times a day. Unless the technique is absolutely perfect, there are going to be certain cases where there will be an overflow

resulting in the wetting of the bed, with discomfort to the patient and more work for the nurse.

The apparatus used in the Carrel-Dakin treatment is complicated and expensive. Rubber tubing is difficult to get and high in price, and a great quantity is needed.

We are told that the main reason that there are fewer infected wounds in the army hospitals now than there were at the beginning of the war is that the primary operation is being performed on an average one and a half hours after the receipt of the injury instead of many hours or may be days. In a hospital using the Carrel-Dakin treatment much time is used in putting the tubes in place and fastening them there. Following a "push", many hours will be used in an operating room doing this work that will keep some less fortunate patient from getting prompt attention.

Because of some of these objections we decided to try out another chlorine antiseptic which was reported in the *Journal of the American Medical Association*, July 7th, 1917, by Dakin, Lee, Sweet, Hendrix, and LeConte, viz.: Toluene-parasulphon-dichloramin, or as Dakin named it, Dichloramine-T. This substance has the chemical formula $CH_3C_6H_4SO_2NCL_2$, and was made first by Kastle, Keiser and Bradey[2] in 1896, and later by Chattaway[3] in 1905, and more recently brought out and used by Dakin.

It is an aromatic chloramine in powder form containing a little over 29 per cent. of chlorine. It is made in the following manner: chlorinated lime (from 350 to 400 gm.) of good quality (of 25 per cent. or more of available chlorine), is shaken with two litres of water in a shaker for half an hour and then allowed to settle. The supernatant fluid is siphoned off and the remainder filtered. Powdered toluene-parasulphonamid, 75 gm., is then added to the whole of the hypochlorite solution and shaken until dissolved. The mixture is filtered, if necessary, placed in a large separating funnel and acidified by the gradual addition of acetic acid (100 c.c.). Chloroform (about 100 c.c.) is then added to extract the dichloramine, and the whole is well shaken. The chloroform layer is tapped off, dried over calcium chlorid, filtered, and allowed to evaporate in the air. The residue is powdered and dried in vacuo.

Another method, more rapid for greater quantities, is as follows: 50 gm. of para-toluene sulphonamid are dissolved in 500 c.c. of water, and 100 gm. of sodium acetate and 100 c.c. of chloroform are added. The container is immersed in cold water, and a rapid stream of chlorine is passed in until the mixture is saturated. The mixture is allowed to stand a few hours, and, if the odour of chlorine

disappears, more of the gas is passed in. If necessary, more chloroform can be added to dissolve the dichloramine. From this point the procedure is the same as in the preceding method.

Its use as a disinfectant is dependent on the reaction of the NCL^2 group in the side chain. In this group the chlorine is very loosely held and is given off whenever the substance comes in contact with any other material having an affinity for chlorine.

This takes place in the presence of proteins. All proteins contain large numbers of amino acid groups represented by the formula $R-\dot{C}(H)-CO-NH$. The H atom attached to the N atom is replaced by the Cl atom $R-\dot{C}(H)-CO-NCl$. This compound then contains the NCl group and belongs to the class of chloramines. Their chlorine is still active and they are themselves active germicides. Other reactions also occur which use up part of the chlorine, converting it into an inert form, *e.g.*, the chlorine becomes united to carbon or forms chlorides. This is the chemical reaction that takes place between the dichloramine-T and the proteins of the bacteria, and this chlorination of bacterial protein seems to be incompatible with the life of the micro-organism.

We know from our study of chemistry that the union of chlorine with other substances is greatly hastened by the presence of water, even the small amount of moisture in the air, by the action of light, especially direct sunlight, and by heat. Keeping in mind these characteristics of chlorine and chlorine compounds we will consider the characteristics of dichloramine-T.

It is only slightly soluble in water, but freely soluble in certain oils and in benzol, chloroform, carbon tetrachloride, alcohol, and acetone. In order that the dichloramine-T may be used efficiently it must be in solution. Of the different solvents, chloroform and carbon tetrachloride are the only two that contain their limit of chlorine and therefore give us permanent solutions, but as these cannot be used continuously on the tissues they cannot be used as carriers for the dichloramine-T. Eucalyptol is one of the oils that will dissolve it, but this oil, having an affinity for chlorine, extracts

the chlorine from the dichloramine-T, causing decomposition. But if chlorine is added to the eucalyptol before dissolving the dichloramine-T in it, we get a fairly stable solution. Originally[4] the eucalyptol was treated with potassium chlorate and concentrated HCl, the result being an oil containing about 1 per cent. of chlorine.

This oil would dissolve about 15 per cent. of dichloramine-T, but because it caused irritation when used on wounds it was found necessary to dilute it up to 50 per cent. with paraffin oil, also chlorinated. These are the preparations that have been on the market for some months.

We, however, had considerable difficulty in getting stable solutions with these mixtures. The addition of the paraffin caused a precipitate to form in two to four days.

In October last, while in Philadelphia, Dr. Paul Lewis, of the Henry Phipps' Institute, told me of another method that they were using to chlorinate the eucalyptol, and we soon had some made in the laboratory here. Since then Krauss and Crede[5] have published this method of making it. Chlorine gas from a cylinder is passed through eucalyptol for about 30 hours in good daylight, the temperature being kept below 80°C. by regulating the flow of gas. This raises the specific gravity from 0·925 to 1·200. It was then neutralized with dry sodium carbonate and dried with calcium chloride, when it was ready for use. This oil would dissolve 20 per cent. dichloramine-T and could be used without diluting with chlorinated paraffin. The great advantage of this solvent was that a solution of dichloramine-T in it was stable for at least six weeks if kept under proper conditions. Also, a great mass of antiseptic, say 20 per cent. dichloramine-T, could be used for a primary application in the operating room.

This is the solvent that we have used in most of our cases up to February 15th. As it did not come on the market, we made it in the laboratory, and after some trouble succeeded in turning out a good product.

In January, 1918, Dakin and Dunham[6] suggested the use of chlorinated paraffin wax, to which they gave the name *chlorcosane*, as a solvent for dichloramine-T. This is made from ordinary paraffin wax chlorinated by passing a rapid stream of chlorine through it until it has increased about 50 per cent. in weight. The temperature must be kept between 125°C. and 140°C. The hydrochloric acid formed is then neutralized with dry sodium carbonate and the oil filtered while hot. We promptly set up the apparatus and made the solvent, and the results are even better than

we anticipated. We obtained a solvent that was much cheaper, materials costing about forty cents instead of four dollars, and the time to make it reduced by several hundred per cent. This solution causes no irritation whatever on the most painful wounds. Another great advantage is that the odour is very much reduced and much less disagreeable. It is a clear oil, slightly heavier than water, with a high viscosity. It will dissolve at room temperature 8·5 per cent. to 10 per cent. of dichloramine-T. To make the solution, it is advisable to heat one fourth of the oil to 80°C., dissolve the dichloramine-T in it and then add the other three fourths of the oil, as the dichloramine-T dissolves much more rapidly in the heated wax.

We use this solvent with 5 per cent. dichloramine-T now in all cases except skin grafts and large superficial wounds such as burns, where we use 1 per cent.

There are several precautions one must take in using dichloramine-T, which all depend on the fact that the solution, if not kept properly, may be easily decomposed.

1. It must be kept in dry brown bottles (blue bottles will not do), and not exposed to sunlight.

2. If water, alcohol, or other adulterant, even a few drops in amount, is introduced into the bottle, it will cause decomposition in the course of twenty-four hours.

3. Decomposition is indicated by the presence of crystals in the solution, or by the appearance of cloudiness. This means that the dichloramine-T has been broken up and toluene-sulphonamide formed. This is not an antiseptic and is an irritant. Therefore, decomposed solutions should be at once discarded. In chloroc-sane solutions, if they are kept cold, the wax may crystallize slightly. Gentle heating will cause this to melt again. Toluene-sulphonamide, the decomposition product, will not dissolve except in hot solution.

4. Bottles or other containers of solutions of dichloramine-T should be cleaned with chloroform as this will dissolve the dichloramine-T and the wax. They should then be thoroughly dried before using. Containers in which the dichloramine-T has decomposed should be washed thoroughly with hot water and dried before using again.

5. Wet dressings should not be put over a wound on which dichloramine-T has been used, because the water will cause decomposition of the dichloramine-T in the wound.

6. If used in an atomizer this should be all glass as the chlorine will corrode metal or hard rubber.

The results we obtained with dichloramine-T were certainly as good as those we had with Dakin's hypochlorite solution. We have a solution now that, unmixed, is permanently stable, or mixed, is stable for from two to three months, and only takes a fraction of the time to make up.

Very little training is necessary to know how to use it, and that only on the part of the surgeon or house surgeon doing the operation and dressings. As the nurses have nothing to do with the dressings, they do not need to be specially trained.

The amount of dressing material used is very much less. On Ward A (Toronto General Hospital) we use about three fourths as much as the other services. On account of the uneven number of dressings done we cannot give exact comparative figures, but Sweet gives figures for a hospital in France. With an equal number of dressings done, the ward using eusol needed three times as much gauze and about 20 per cent. more cotton than the ward using dichloramine-T.

The apparatus necessary for the use of the dichloramine-T is an all-glass atomizer and occasionally a glass pipette or a small rubber catheter, which is considerably less than the Carrel apparatus.

The time necessary for the primary operation is considerably lessened as there are no tubes to put in place and retain there. The time used in doing the dressings is also less, Sweet reporting that he does thirty major dressings in ninety minutes.

Considering the question of the transportation of wounded, it is well known that the Carrel-Dakin treatment cannot be carried out when a patient is being transported, but with dichloramine-T it is quite simple.

We wish now to present in detail the method of using dichloramine-T in different conditions with certain case reports.

We have purposely put the treatment of newly made wounds at the first in order to make it more impressive, because we feel that in this class of wounds, dichloramine-T is of the most service. We are more and more impressed with the importance of the interval of time elapsing between the receipt of the injury and the time of primary treatment as being the most important factor in the prevention of infection.

In the battle of the Champagne 80 per cent. of the cases contained the gas organism in the wound when cultured and 60 per cent. had the clinical symptoms, but in the battle of the Somme but 20 per cent. had gas on culture and only 5 per cent. showed

clinical symptoms. In 1915, our mortality was 4·6 per cent. but in 1916, it was only 1·9 per cent. Why this improvement? Many voluminous reports have appeared of greatly improved results in the treatment of wounds with many germicidal agents.

But the fact that this improvement was not confined to wounds treated with any one particular germicide suggests that at least other factors might be equally important. The organization of the armies had so improved during this year and a half *that the wounded were being treated in one and a half hours instead of from five to seven days.* Furthermore, the surgeons were equipped more completely so that the primary operations were thorough. Removal of 20 per cent. of the foreign bodies and routine free incision with wide excision of dead and devitalized tissue had been practised.

It is no doubt these two points that have brought down the death-rate. Moynihan and Crile claim that all that is necessary is excision of the devitalized tissue. Carrel technique calls for the same operation.

Our technique has been to use gasoline to clean the surrounding skin, to remove as much devitalized tissue as possible, then swab all the wound surfaces with dichloramine-T, leaving them wet with it and, if the wound has been received within six hours, to stitch it up without drainage.

Dichloramine-T does not affect the tensile strength of catgut, nor the holding of the knots, so that the danger of secondary hæmorrhage from the slipping, or premature absorption of ligatures can be disregarded.

At the Midvale Steel Works, near Philadelphia, where there are about 12,000 employees and where there is a well organized hospital that keeps accurate records, the following comparative results are given.

In 1916 they used iodine, and in 1917, dichloramine-T.

Using iodine they had 9·8 per cent. of their wounds show infection.

With dichloramine-T they had 1·5 per cent. of their wounds show infection.

Primary suture of wounds using iodine as antiseptic gave pus development in 11.6 per cent., while using dichloramine-T there was pus development in only 5·4 per cent.

In a series of thirty-two consecutive cases attended by us we had infection following in one case only, or 3·1 per cent.

Compound Fractures.—In the case of compound fractures we take a swab from the wound for culture, before using any dichlora-

mine-T. Then the wound is opened widely and the devitalized tissue cut away, including the edges of the external wound. Dichloramine-T is then inserted into the seat of fracture, all areas of the wound being thoroughly saturated with it. If the fracture is a recent one, that is, within three or four hours, we would close it without drainage. If over this time, we insert a gauze drain saturated with the oil. This is removed in forty-eight hours and more of the oil injected into the wound. When we get a negative culture from the wound for three days in succession we close it, dealing with the fracture by bone-plating or pegging as we see fit.

Case Report. A. K., admitted to Ward A, Toronto General Hospital, November 27th, 1917, about fourteen hours after sustaining comminuted fracture of lower end of humerus with small lacerated wound. This wound gave us a culture of staphylococcus and streptococcus. It was opened widely, swabbed with dichloramine-T, packed with dichloramine-T gauze, and partly stitched. More oil was injected into wound through a medicine dropper daily. Several negative cultures were obtained and about two weeks after admission the wound was opened, the two lower fragments were fastened together with a bone screw, and the upper fragment when reduced was held in place by its spiculated extremity. The wound stayed clean and he was discharged five and a half weeks later.

Secondary Suture Cases. The question of the secondary suture of wounds is a very important one, especially from a military standpoint. One of our earliest cases is an illustration of the efficiency of dichloramine-T.

Case shown to Surgical Section in November, 1917. E. D., admitted to Ward A, Toronto General Hospital, September 18th, 1917. About one month previous he had had his foot crushed and a Syme's amputation was performed. The wound became infected and on admission to the hospital the flap had dropped down, and its anterior surface as well as the end of the stump was covered with thick unhealthy granulation tissue with a few small sloughs still attached. The discharge from the wound was a thick yellow pus with a very foul odour. Culture showed staphylococcus infection. The wound was sprayed with 5 per cent. dichloramine-T. In twenty-four hours the odour had disappeared and the discharge had lessened considerably. On the sixth and seventh days by direct smear we could find no bacteria, and on the ninth day we scraped off the granulation tissue, trimmed the edges of the flap and stitched it into place. There was a slight discharge from a small sinus at

the side of the wound for some time, but when a small sequestrum from the end of the stump was removed, the sinus soon closed. This illustrates a point we have proven by several cases, viz.: that if a wound does not soon become sterile with the use of dichloramine-T, it is either because the antiseptic is not getting to all parts of the wound or there is a foreign body present.

Cellulitis. The focus should be excised when mechanically practical, but if this is impossible it should be widely exposed so that the germicide may have an opportunity for a complete chemical contact with the bacteria. Adequate drainage should be provided according to accepted surgical principles. Then the wound surfaces should be thoroughly covered with dichloramine-T solution and the edges of the wound held apart by gauze packing saturated with the solution. A very light gauze dressing is then applied, not more than four layers of gauze being necessary. If the discharge is excessive, fresh gauze may be reapplied during the day, but in our experience this is not necessary for more than a day or two. One does not need to use thick cotton pads on these wounds. The dressing is done once a day using all aseptic precautions. The gauze packing is removed and not reapplied unless the walls of the wound fall in and make it impossible to insert the antiseptic. Dry cotton wipes only are used to wipe out the wound. The dichloramine-T is sprayed into the wound with an atomizer if it is superficial, or injected into the deeper parts through a soft rubber catheter or a glass pipette. The same minimum amount of dressing material is used. When a culture shows the wound to be sterile it is not necessary to do dressings oftener than once in two or three days.

Case Report No. 1. T. B., referred by Dr. Shields. Admitted to Ward A, February 11th, 1918. Four days previous his left wrist became swollen and sore. Two days later it was swollen to the elbow. On admission the arm from wrist to shoulder was greatly swollen, browny red, and extremely painful. There was a small area of fluctuation over the top of the olecranon. Temperature, 103·4°; pulse, 140. Patient was perspiring profusely and was profoundly toxic. Operation, 9.30 p.m., February 11th. Incision into the fluctuating mass over the olecranon revealed a bursa full of clear serum. Eleven other incisions each about two inches in length were made in the arm. From the incisions above the elbow just a clear serum was obtained, but from those below the elbow a thin watery pus exuded. The infected subcutaneous tissue was broken down with the finger. The wounds were then swabbed with 20 per cent. dichloramine-T, and gauze packing soaked in the same

strength solution was inserted into the subcutaneous space between the incisions. Light dressing applied and patient returned to ward with orders to the nurses to keep several hot water bottles applied to the arm continuously.

Culture of the pus showed presence of pure streptococcus.

On the second day after operation the temperature was normal and remained so. On the seventh day culture from the wound was sterile and on the twentieth day all the wounds were closed except the one over the olecranon.

Case Report No. 2. F. S., admitted to Private Patients' Pavilion, Toronto General Hospital, under Dr. F. N. G. Starr, December 26th, 1917.

Three days previously he cut his right hand on a porcelain tap. On admission the temperature was 101°, pulse 132. The hand was greatly swollen, extremely painful, and the skin over the hypothenar eminence was black, and on removal it was found that the muscle underneath was apparently gangrenous. There was a thin watery discharge from all parts of the palm. The infection was opened by four incisions and was swabbed out with 20 per cent. dichloramine-T. Three tubes were inserted for drainage. Culture showed pure streptococcus.

On the third day his temperature was normal, and in a week a culture from the wound was sterile and in less than three weeks was completely healed.

Carbuncles. Until recently we always felt that we got better results by completely excising a carbuncle. Our method of treatment has changed, however, since using dichloramine-T. We now make a crucial incision, curette out as much of the necrotic tissue as possible, insert a drainage tube through the base of each flap, swab out the wound with 20 per cent. dichloramine-T and leave it packed with gauze soaked in the same solution. The gauze is removed the following day and replaced by fresh gauze soaked with 20 per cent. dichloramine-T. The day following all packing and tubes are removed and the wound thoroughly sprayed with 5 per cent. dichloramine-T. The force of the spray very soon dislodges any particles of necrotic tissue left.

We have treated several cases, but one will illustrate.

Case Report.—T. G., referred by Dr. C. E. Stacey on February 2nd, 1918. Carbuncle three and a half inches in diameter on back of neck. It had several openings and was discharging profusely. It had been incised three days previously but was now spreading rapidly. Crucial incision, sloughs swabbed out with

gauze wipes, drain put in base of each flap after swabbing our with 20 per cent. dichloramine-T. Daily dressings with 5 per cent. dichloramine-T. On the seventh day all slough was gone. On ninth day the incisions were healed with the exception of a small area in the centre that was granulating over. On the twentieth day the wound was healed.

Lee advises secondary suture if the wound becomes sterile before the twelfth day. He reports good results. We have had no satisfactory cases to try it on.

Intra-abdominal Infections. We have used dichloramine-T in several cases of appendicitis that required drainage. Our technique in these cases was to swab the bowel in the neighbourhood of the infection with 20 per cent. dichloramine-T, pack gauze soaked in the solution into all parts of the infected area, insert through and through silk-worm gut sutures, and leave them untied. In cases where the split muscle opening was made the two middle sutures were so inserted that when drawn tightly, they pulled the separate parts of the internal oblique muscle together. The following daily dressings consisted in applying from two to three c.c. of the oil around the wound and gauze, and in about four days the gauze will come out quite easily. Each day after this the sinus is filled with 5 per cent. dichloramine-T. On obtaining a sterile culture from the wound, the sutures are tied. Sometimes it will only be necessary to leave a small opening for the gauze and stitch up the rest of the wound. In this case after the gauze is removed the sinus is filled daily with oil until it fills in with granulations.

Frequently there are appendices removed and the question arises as to whether a tube should be put in for drainage, owing to the gangrenous condition of the organ and the possibility of a small amount of peritoneal infection being present. In these cases, if one will thoroughly swab off the bowel in the neighbourhood of the appendix stump with dichloramine-T, and likewise the incision through the abdominal wall, one will find that the antiseptic is enough to take care of any infection left.

Any other intra-abdominal infection can be treated in a similar manner.

Case Report No. 1.—Mr. S., patient of Dr. F. N. G. Starr.

November 14th, 1917, large appendiceal abscess opened through split muscle incision and appendix removed. Cavity swabbed out with 20 per cent. dichloramine-T and packed with gauze, 20 per cent. Silkworm gut stitches put in, but not tied. In this case the gauze was removed the next day by the houseman. For fourteen

days 5 per cent. dichloramine-T was injected into sinus. On fourteenth day the bacterial count was 1-10. The granulations were swabbed off the surface and the stitches tied. There was only a very slight discharge after this, and the patient walked out one month from the day he came in.

Burns. It appears to us that in the treatment of burns there are three things to accomplish: (1) the relief of pain; (2) the control or elimination of infection; and (3) the promotion of healing. The first point is accomplished if a dressing is used that does not cause pressure or irritation to the wound; the second is obtained if an efficient germicide is used—for all burns are infected; the third results from the use of a dressing that does not need to be changed frequently, thereby causing the least disturbance to the delicate newly formed epithelial cells, and the use of an antiseptic that does not injure the newly formed cells nor cause the formation of unhealthy granulation tissue.

As a dressing for burns we use an open mesh paraffined mosquito netting as suggested by Captain W. P. Furness[8] of Philadelphia. It is made by dipping sterilized mosquito netting into melted paracol, or other wax with low melting point, and allowing to drain. This results in a thoroughly waxed, open meshed gauze. This is placed in close contact with the surface of the burn and fastened around the edges with hot wax or adhesive. No other dressing is put over this but it is left exposed to the air. The wound is sprayed with 1 or 2 per cent. dichloramine-T daily. As the discharge forms it comes out through the open meshed gauze and can be picked off at each dressing with a pair of forceps without removing the gauze. This is a painless procedure and does not interfere with the delicate newly formed tissue. As the dichloramine-T is not an aqueous but an oily solution, it does not tend to make the granulation tissue œdematous, but rather we note that it is of a very bright red healthy colour and does not heap up. We feel that this dressing deals with the three essentials in the treatment of burns as efficiently, if not more so, than any other.

Case Report.—J. W., February 21st, 1918. Patient fell with forearm against the stove, causing burn of third degree, and tipped hot gravy over arm causing scald about eight by five inches. When seen next day the blisters were broken and considerable discharge was present. Wound cleaned with dry wipes and dressing forceps. Edges of wound cleaned with gasoline. Paraffined gauze fastened on with adhesive. Sprayed with 5 per cent. dichloramine-T in chlorcosane. Dressed daily. Crusty discharge removed with for-

ceps from surface of netting and sprayed with 1 per cent. dichloramine-T. The dressings were painless and easy. On the tenth day the scald wound was healed and on the nineteenth day the burn wound was healed.

Skingrafts. It has heretofore been considered impractical to skingraft wounds that were not sterile, partly because the grafts would not take, and partly because antiseptic dressings could not be used for fear of destroying the grafts. We have found that it is not necessary, although it is to be preferred, to have the wound absolutely sterile. We get the wound as sterile as possible, lay our grafts and cover them with the paraffined netting spoken of above. This is left exposed to the air. Each day the discharge that forms is removed from the outside of the netting and the whole wound is sprayed with 1 per cent. dichloramine-T. About the tenth or eleventh day the netting is removed without any difficulty whatever. It shows no tendency to adhere to the wound or the grafts.

We have had several good cases but two of them will illustrate.

Case Report No. 1.—G. H. A., admitted to Toronto General Hospital under Dr. F. N. G. Starr, on January 21st, 1918. Seven weeks previously scalded left leg to knee. Wound became infected, and among others, the following dressings were used: moist boracic, bichloride, 1-100 carbolic, boracic ointment, amberine, normal saline, and Dakin's solution. None of these were efficient and when admitted to the hospital the most of the surface of the leg was devoid of skin and discharging a foul purulent matter. It was cleaned and swabbed with 20 per cent. dichloramine-T, and he suffered for some hours. The next day he told us the leg had not looked as well in seven weeks. We used 5 per cent. dichloramine-T daily, and as soon as the infection became controlled the skin grew in very rapidly. On the seventh and ninth days culture from wound was sterile, and on the tenth day it was skin-grafted. Daily dressings were done, each time removing the discharge that had come through the netting, without disturbing the grafts. At first we had normal saline sprayed on the wound every hour. We have since come to the conclusion that that is unnecessary. Daily applications of 1 per cent. dichloramine-T with atomizer is all the dressing necessary to keep the grafts soft. On the eighteenth day the netting was removed and the graft had practically all taken. This man walked our of the hospital about six weeks after operation.

Case Report No. 2.—W. B., admitted to Ward A, Toronto General Hospital, January 21st, 1918. Hand was crushed between

steel rollers, the skin being pulled off and several of the phalanges fractured. The tips of the fingers were all amputated and the hand dressed with dichloramine-T. Pyocaneus infection followed. This was very difficult to clean up, but when the wound was granulated over and all sloughs removed, even when pyocaneus was still present, we skin-grafted. This was covered with the netting and dichloramine-T applied daily. The graft took perfectly and in four weeks all dressing was removed from the hand.

We have no experience with the use of dichloramine-T in *brain work*, but Harvey Cushing[7] reports as follows:

At a casualty clearing station in France in three months they had one hundred and thirty-three cases of wounds with dural penetration. Among the first forty-four cases they had twenty-four deaths, or 54·5 per cent. Among the second forty-four cases they had eighteen deaths, or 40·9 per cent. Among the third forty-five cases they had thirteen deaths, or 28·8 per cent.

He attributes the lowering of the death-rate to four prinicpal changes in their technique, viz.: (1) the removal *en masse* of the fractured area of the cranium; (2) the probing of the wound in the the brain for foreign particles with a soft rubber catheter instead of the finger; (3) the removal of the disorganized brain tissue by gentle suction through a catheter; and (4) the routine use of dichloramine-T. In speaking of the last point he says:

"The use of watery solutions of antiseptics in the brain is disappointing for they lead to œdema and swelling of the tissue and an increased tendency to herniate. It was not until Dakin's dichloramine-T came to be utilized as a routine during the latter weeks of our service that there was a notable diminution in the number of infections.

"It is true that the technique of the procedure had greatly improved at this time and true also that we can record no thoroughly conclusive bacteriological studies, though cultures of many of the wounds and foreign bodies were made. With dichloramine-T in not a few cases in which an infected foreign body was removed and in which bone fragments as well gave an abundant growth, no symptoms whatever followed closure of the wound without drainage. In two instances the cultures showed the presence of the pneumococcus in the ventricular fluid, and the only patients in the series who have recovered from active gas infection of the brain were treated with dichloramine-T."

He used a soft catheter to inject a few c.c. of dichloramine-T

to the bottom of the cavity, and then moistened the surfaces of the external wound with it before sewing up.

Tubercular Wounds.—Our experience with the use of dichloramine-T in tubercular wounds has been limited owing to the unsatisfactory results obtained in a couple of cases some months ago. Following this, we treated some active tubercle bacilli with dichloramine-T for varying lengths of time by putting an emulsion of the bacteria on some dichloramine-T in a test tube. The chlorine from the dichloramine-T gradually infiltrated the emulsion. In three, five, fifteen, thirty and sixty minutes, and again in twenty-four hours we removed part of the emulsion and injected it into guinea pigs. Up to and including the thirty minute case the bacilli grew, but from one hour and longer the guinea pigs were negative.

When we remember that it takes 5 per cent. carbolic acid with equal quantities of sputum, intimately mixed, about twenty-four hours to kill the tubercle bacillus, and that $2\frac{1}{2}$ per cent. carbolic will not even kill then[9], we cannot help but feel that dichloramine-T is also efficient for tubercular wounds. Further experiments are being carried out now.

Empyema of the Pleural Cavity.—Our experience with dichloramine-T as a sterilizer for empyema cavities has not been altogether encouraging. Two acute cases following pneumonia had a short convalescence, which was very satisfactory. Three old cases in which the cavity had been draining from three to twelve years were treated by Estlander operations, and shortly afterward dichloramine-T was injected into the remaining cavities. The oldest case closed in a few weeks; in the second case the cavity diminished to one fourth the former size in two months. We are hoping it will close completely. The cavity in the third case is practically the same size as it was when we started the treatment. This patient had syphilis until recently, which may account for this poor result.

One gratifying point about the use of dichloramine-T in these cases is that the patients all feel better and apparently there is much less toxin absorbed as long as the oil is being used.

Our technique has been to insert a soft rubber catheter into the cavity and inject through it from 5 c.c. to 20 c.c. of the oil. Then we have the patient move slowly into different positions in order to get the oil to flow to all parts of the wound. This dressing is done once a day.

From several of our cases we have obtained a negative culture after several days' treatment, but if we discontinue injections for a few days, the bacteria again appear.

It may be that if, at the time of the Estlander operation, a strong solution of the antiseptic was used before sewing up the skin wound, or if the cavity were packed with gauze soaked in the oil, the results might be a little more satisfactory.

Mastoiditis.—From reports received from several of the ear, nose and throat men who are using dichloramine-T in mastoid infections, I gather that it is also effective in these conditions. Dr. Charles Clark tells me of three bad mastoid cases that closed completely in eleven, twelve, and fourteen days respectively. He notes particularly the early disappearance of pus, the healthy appearance of the granulations, and the rapid closing of the wound.

Urethritis.—I have just used dichloramine-T on one case of gonorrhœal infection. In this case I sealed the oil in the urethra and left it there for nine hours. The patient complained the next day of pain on micturition, but I have been unable to find any trace of gonococci in the smears since. I would advise, instead of sealing in the oil, that it be held for ten or fifteen minutes only. It must be noted here that only solutions in chlorcosane should be used. Solutions in eucalyptol would cause irritation.

Drs. Jones and Hair are going to use it in the Genitary Urinary Clinic at the Toronto General.

Diphtheria Carriers. When Dakin first suggested the use of dichloramine-T as an antiseptic he used it to disinfect the nose and throat of diphtheria and meningitis carriers. When the technique is properly carried out, this makes a very efficient treatment. Saline should be used first, to clean out the nares and throat, and then the dichloramine-T in 5 per cent. solution sprayed on with an atomizer every three hours. Spraying should be discontinued for twenty-four hours previous to taking a culture, and if it proves negative, the spraying is discontinued again for twenty-four hours. In the case of getting two negative cultures, the patient may be considered no longer a carrier. We had a very good opportunity recently to test this out. Dr. W. C. Allison of the Provincial Board of Health spent some weeks in a western town cleaning up an outbreak of diphtheria. They used dichloramine-T on fifty-nine cases. These cases had been in quarantine on an average of fourteen days and they were released after using dichloramine-T on an average for five days. Nurses gave all the treatments, which were carried out, not every three hours, but only three times a day. Those who have

worried over these cases for weeks and may be months, will realize how quickly these cases were cleaned up.

Colonel Primrose, who has seen at first hand the results obtained by the originators of several of the modern methods of treating infected wounds, warns us that we must keep an open mind regarding this question. They all claim good results, and he has seen that they are getting them. All others do not get these good results, no doubt, because they do not know or do not adhere to the proper technique. We *know* that dichloramine-T will sterilize infected wounds if it gets into all parts of the wound and there are no foreign bodies present, and we feel that, as the technique is so simple and the results just as good, we have in dichloramine-T an antiseptic that is, at least, among the best.

I would like to thank Captain Roscoe R. Graham for inducing me to take up this study, Dr. F. N. G. Starr for furnishing most of the clinical material and much encouragement, Captain Walter Campbell for his help with the chemistry and laboratory work, and Dr. Laughlen for his assistance with the bacteriological work. Without the help of these my work would have been without results.

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CEREBRO-SPINAL SYPHILIS

By Gordon S. Mundie, B.A., M.D., and
R. J. Erickson, A.B., M.D.
Montreal

SINCE the discovery of the spirochæta pallida in the brain of patients who had died from dementia paralytica, and also in the cords of those who had died from tabes dorsalis, the classification of syphilitic diseases of the central nervous system has been greatly altered. We no longer speak of the parasyphilitic diseases of the nervous system but according to whether we adopt the classification of Head and Fearnsides or the more American classification we speak of, syphilis meningo-vascularis or syphilis centralis, or, the interstitial form of cerebro-spinal syphilis, and the parenchymatous form. Naturally we may have and often do have a mixed form. Under the first class we place all the acute or sub-acute cases of involvement of the central nervous system and under the second class we have the chronic cases of tabes and general paresis or the mixed type of tabo-paresis.

We have analyzed from the records of the Royal Victoria Hospital during the last twenty years seventy-four cases of the interstitial type and also have taken six cases of tabes seen in the last year and reported them mainly to show the effect of treatment than from a clinical standpoint. In the seventy-four cases are included three cases of hereditary syphilis but no cases of general paresis.

An analysis of the seventy-one cases reveals some interesting facts. First as regards the history of infection. Fifty-three of the seventy-one cases or 75 per cent. admitted being infected one or more times; eighteen or 25 per cent. denied all knowledge of infection; fifteen of the fifty-three cases or 20 per cent., which admitted infection, gave a history of secondary manifestations of syphilis. This fact is interesting because Ellis, Swift, Mott and others have called attention to the fact that a history of secondaries is rare in patients suffering from tabes dor alis. In a series given by Ellis and Swift sixteen of the thirty patients, or 50 per cent., denied all knowledge of secondary manifestation. They, however,

agree with our figures which show that a history of secondaries is more common in patients suffering from cerebro-spinal syphilis, as only five of their patients denied secondaries. The question of obtaining a history of infection from a patient is sometimes difficult, but in our opinion, it is not so difficult as it is generally considered, if the patient is approached in the right manner. Very few men, if asked quietly and in private, will refuse the knowledge of having been infected, if they have been, at some time in their past life, but if asked abruptly before a class of students or in a public ward, will resent the publicity of the questioning and therefore refuse all knowledge. When dealing with women the question, of course, assumes a different aspect, and one is not justified in putting direct questions to a patient, but must rely on the personal and married history.

We have subdivided the seventy-four cases of the interstitial type of cerebro-spinal syphilis into eight divisions according to what part of the central nervous system the symptoms seemed to indicate was most involved: 1 Vascular. 2. Spinal. 3. Meningeal cerebral. 4 Gumma. 5. Basal meningitis. 6. Parenchymatous. 7. Peripheral nerve. 8. Hereditary.

Vascular Type. There were twenty-two cases of this type, and it was the second most common type of all the cases. Thirteen of them were straight vascular involvement. In these cases the most prominent symptom is motor, usually a hemiplegia, which is preceded by headaches for a varying length of time. Case No. 20491 is an example of this type.

E. F. L., age twenty-seven, admitted November 24th, 1913. Complaints—Unable to speak. History—Soft chancre four years ago. No secondaries. Married three years; wife had had two miscarriages. Six weeks ago severe left frontal headache began. Shortly afterwards paralysis of the right face, arm and leg with deviation of the tongue to one side appeared. Report from the out-door department October 30th, 1913, was: paresis of the right facial nerve, tongue protrudes to the right, speech is slow, paresis of the right arm. On November 23rd suddenly lost the power of speech and was unable to swallow. Headache stopped yesterday.

Physical findings. Paresis of the seventh, ninth and eleventh cranial nerves on the right side. Cannot open mouth. Cannot swallow. Both hands are weak. Right fore-arm moves involuntarily. Marked inco-ordination of the arms and one of the legs. Paresis of the vocal cords. Ankle and knee jerks are increased on both sides. Retention of urine. Spinal fluid Wassermann was

negative, Noguchi test positive, six cells, blood Wassermann positive. He was given neo-salvarsan on December 16th and showed gradual improvement. In five weeks he wa speaking, but had only poor use of his legs. December 27th he went to Pawtucket, R.I.; while there he had inunctions daily and massive doses of iodides.

Two of the ca es had symptoms pointing to involvement of the meninges sufficient to produce definite signs of meningeal irritation, becau:e in nearly all cases of cerebro-spinal syphilis the meninges do not escape.

P. R., admitted September 15th, 1900. Complaints—Paralysis of the left arm and leg, with contractures. Spasms of the right side of the body. History—Married seven years. Five miscarriages. Hair fell out after one miscarriage. Husband had some blood d sease. Two and a half years ago had violent headaches, worse in the morning, and insomnia. Vomiting and gradual onset of paralysis with spasm first in the face and then in the arm and leg which occurred seven or eight times a day. In a month there was complete paralysis of the left side. In two months the face recovered, the leg only slightly, and the arm not at all. Two years ago contracture of the left side of the body began. She was treated for one month in the Montreal General Hospital with some improvement of the leg and arm. Later she developed incontinence of urine and fæces.

Physical findings. Spastic flexed arm, left leg spastic to a less degree, ace not affected. Tremor and inco-ordination of the left side. Tactile sensation somewhat impaired on the right side. Some hyper-æsthesia on the right side of the face and right shoulder. She was given potassium iodide in the ward. Improved slightly. Discharged December 12th.

Spinal Type. Nine cases were of the spinal type where the symptoms pointed mainly to an involvement of the cord and under this heading we classed those cases where there was mainly meningeal involvement, meningo-myelitis and radiculitis. Three of them were diagnosed as meningo-myelitis in whom the symptoms were spastic paralysis of the legs or arms depending on the site of the lesion, more or less sensory involvement, increased reflexes and loss of sphincter control.

Case No. 18733 is an example. D., age twenty-eight, admitted September 12th, 1912. History—One year ago contracted syphilis, since then he has been under treatment. Two months ago headache started. Eight days ago had tingling in the legs. Five days ago right leg became paralyzed and had retention of urine.

Physical findings. Paralysis of the right side below the eighth dorsal segment. Paralysis of the left leg below the knee. Paresis of the left thigh. Hyper-æsthesia below the eighth dorsal spine. Anæsthesia below the eighth dorsal spine on the left side; no loss of sensation on the right side. Knee jerks active right and left, right ankle clonus, extensor plantar response on both sides. September 15th was given ·6 salvarsan intravenously. September 30th, incontinence developed, both legs became paralyzed, anæsthesia developed on the right side. In October had many bowel hæmorrhages and died October 16th.

Autopsy. Ulcerative syphilitic colitis and syphilitic myelitis.

One of the cases was diagnosed before admission to the hospital as a case of subacute combined sclerosis on account of apparently clear history of no infection, the age of the patient and the unmistakable sign of involvement of the posterior and lateral tracts.

Case No. 24350. A. T., age forty-six, admitted July 24th, 1916. Complaints—Unsteady gait. History—Seven months ago noticed his gait was unsteady and it has gradually become worse. Two months ago incontinence, with pains and needle sensations in the legs. Examination showed spastic legs with inco-ordination, knee jerks very brisk right and left, double extensor plantar response, considerable Rombergism, loss of joint sense in the hands and toes, unsteady spastic gait. Spinal fluid showed twenty-four cells, positive Noguchi, Wassermann was triple plus and Lange's gold test was positive with a leutic reduction. He was given one injection of salvarsanized serum intra-spinally, and then was discharged at his own request, unimproved.

Two of the nine cases of the spinal type had symptoms pointing to a definite involvement of the posterior roots, such as shooting pains in different parts of the body.

Case No. 24480. M. R., age thirty-nine, admitted August 29th, 1916. Complaints—Headache, pains in the shoulders, abdomen, knees and right breast, vomiting. History—Sores in vulvæ, December, 1915. She was given a salvarsan injection. For four weeks has had the above complaint. Examination showed eight cells in the spinal fluid with negative globulin, triple plus Wassermann and negative gold test. She was given one fiftieth of a grain mercury bichloride in normal saline intra-spinally, which produced an increase of the symptoms.

Meningeal—Cerebral. Thirteen cases out of the seventy-four were classed under this type. The symptoms were mainly headache, epileptiform fits, and stiff neck. Four of these cases pointed to involvement of the convexity.

Case No. 22122. P. C., age twenty-seven, admitted February 11th, 1915. Complaints—Unconsciousness. History—In the last four months he has had fits in which he falls to the ground and bites his tongue. Two days before admission he fell unsconcious and has been unconscious since. Restless and irritable and knows no one. Examination showed fundi negative, spastic arms and legs, incontinence, pin-point pupils. Blood Wassermann was positive. Spinal fluid was cloudy, globulin very positive and seventy-three cells. He was given salvarsanized serum intra-spinally and discharged, speaking and feeling much better.

Six cases were of the general meningeal type where the main symptoms were headache, general weakness and subjective sensory disturbances.

Case No. 21110. J. A., age twenty-nine, admitted May 7th, 1914. Complaints—Weakness. Numbness of the arms and legs. Headache. History—Syphilis three years ago. Secondaries six months later. Persistent treatment, including seven injections of salvarsan, the last one two months ago. One year ago general weakness began. Girdle sensation and deadness of the arms and legs. Six months ago headaches began, not definitely localized, worse in the day. Four months ago hands became shaky. Examination showed tremor of the tongue. Deep reflexes all increased. Right extensor plantar response. Spinal fluid showed increased globulin in twenty-four cells. Hermann Perutz test was positive on the blood and spinal fluid. He was given salvarsanized serum intra-spinally. Re-admitted June 14th 1914, with his general condition much improved; has worked for the first time in nine months. Spinal fluid was under pressure with increased globulin and three cells. He was given salvarsanized serum intra-spinally.

Gumma. There were only two cases in the series that we could diagnose as being of a gummatous nature. One had symptoms and signs of involvement of the left calcarine fissure.

Case No. 23404. E. C., age forty-two, admitted November 30th, 1913. Complaints—Defective vision and headache. History—Five years had temporal headaches. These have not been so severe the last two years. Three years ago became suddenly blind in the left eye. Sight returned, but there has been a steady increasing failure of vision until four weeks ago, when he began to improve again. Denies infection. Examination was negative except for a marked concentric contraction of the visual field of both eyes, with left sided hemianopsia. Blood Wassermann was positive. Spinal fluid was under pressure with increased globulin,

six cells and triple plus Wassermann. He was given salvarsan intravenously, and discharged improved.

Basal Meningitis. This, our largest class, was composed of twenty-three cases. Ten cases had symptoms of involvement of the base only. These symptoms were very severe headaches, optic neuritis, vomiting, paralysis of one or more cranial nerves and spastic paralysis of the arms and legs.

Case No. 10265. D. M., age thirty-eight, admitted October 12th, 1905. Complaints—Headache, weakness, incontinence of urine. History—In 1900, had chancre. One year ago headaches began and also had pains in the legs. September, 1904, had frequency of urination with urgency. Six months ago dizziness and diplopia. Six weeks ago weakness of the left leg. Three weeks ago vomiting began and has persisted. Examination showed paresis of the left arm and leg, some weakness in the right arm. Reflexes increased especially on the right. Left extensor plantar response. Rombergism positive. Paresis of the right internal rectus muscle. Patient had excessive vomiting with nausea and dizziness so that rectal feedings were necessary. The left sided weakness increased until the arm was almost paralysed. Nystagmus developed in both eyes. The right vocal chords were paralyzed and there was paresis of the right half of the palate. She was given mercurial inunctions and potassium iodide and was discharged January 27th. The vomiting had ceased but her condition was otherwise much the same.

One of the cases showed involvement of the two upper branches of the fifth nerve.

Case No. 7091. Mrs L. S., age thirty, admitted July 10th, 1902. Complaints—Headache, vomiting, paralysis of the face and left arm, sore left eye. History—Six abortions, since then five living children. Four years ago had sore throat and nose, and hair fell out. Three years ago, discharge in the left ear with resulting deafness. Two years ago sudden facial paralysis—the left eye was open and the face was drawn to the right. One year ago headaches, temporal in character worse in the morning before arising. Six months ago pain in the left eye developed. Four weeks ago unconscious for fifteen minutes. Three days later another unconscious attack, during which there were clonic movements of the whole body. Since then she has had seven convulsions with loss of consciousness and other attacks of tingling and jerking of the arms without loss of consciousness. Three weeks ago vomiting began.

Examination showed diminished sensation over the left two upper branches of the fifth cranial nerve, involving the conjunctiva, nose, mouth and tongue to the mid-line. A left-sided facial paralysis. Diminished taste and smell on the left side. Deafness on the left side with a discharge. The pupils were active. Tongue was protruded straight. Anterior staphyloma. Knee jerks were increased. On August 15th, patient burnt the left side of her face while washing with hot water. Had three fits while in the ward. She was treated with mercurial inunctions and potassium iodide. Discharged August 17th, improved.

Only one case of the series showed involvement of the cerebellum.

Case No. 15990. L. S. L., age twenty-one, admitted September 17th, 1910, complaining of vomiting and dizziness. History—Eighteen months ago possible infection. Five months ago paralysis of the right leg and paresis of the right arm. Three weeks ago began to have dizziness and vomiting. Examination showed left nystagmus. Diplopia on looking to the right. Weakness and incoordination in the right arm and leg. Reflexes normal, no Babinski. He was given inunctions and potassium iodide for three weeks. He left the hospital November 3rd without any symptoms. Diagnosis—cerebellar syphilis.

He returned April 24th, 1911, with a history of having weakness in the legs for two months and in the left arm and leg for one week. He was given ·5 grammes salvarsan intravenously. Discharged improved. Re-admitted December 15th, 1915. On April 15th he had had vomiting and dizziness for eight days and since then the dizziness has persisted, and he had had two vomiting spells. In July his gait became uncertain. In December began to have weakness in the arm and leg with headaches and ataxia of the right arm. Examination showed paresis of the right side, double Babinski and ankle clonus. Asterognosis in both hands. Romberg positive. Anæsthesia of the right upper chest. Diplopia and central nystagmus. Fundi negative. Blood Wassermann negative. Spinal fluid Wassermann negative, five cells and no globulin. He was given a course of mercurial inunctions and iodides for one month. Discharged improved.

Peripheral Nerve. There were two cases in the series of peripheral nerve involvement. The first case showed involvement of the seventh and eight nerves.

Case No. 24836. A. T., age thirty-five, admitted November, 1916. Complaints—Headache, dizziness, deafness, unsteady gait,

with paralysis of the face. History—Fifteen years ago had a discharge from the right ear for three months. July 15th, 1916, had a chronic ulcer on the left side of the neck. August 29th, 1916, had salvarsan intravenously in the Out-door, when blood Wassermann was positive. After a second salvarsan, the ulcer completely healed. Five weeks ago he had dizziness ataxic, gait, nausea, and has had vomiting for three weeks with progressive facial paralysis, headache, deafness and tinnitus. Barany's test showed both vestibular and cochlear involvement in the left ear. There was no caloric reaction. He showed no mystagmus, dizziness or pointing error after syringing for four minutes with ice water. Complete right facial paralysis of the peripheral type. All the tests on the spinal fluid were negative. He was given one intra-spinal salvarsanized serum and twenty days after admission the facial paralysis had almost entirely disappeared, caloric reaction was present, hearing was much improved, headache and dizziness were gone.

Second admission, December 2nd, 1916. Very little paresis of the facial nerve. Hearing normal. Vestibular symptoms disappeared. March, 1917, no symptoms.

The second case showed only involvement of the third nerve.

A. R., age twenty-four, admitted September 15th, 1915. Complaints—Dimness of vision. History of syphilis three years ago. Was treated with six salvarsans and mercury intra-muscularly. Examination revealed paresis of the ciliary muscle. He was given four intra-spinal injections of salvarsanized serum when the spinal fluid was negative and all symptoms had disappeared.

Hereditary. Three cases in the series were diagnosed as hereditary. The most interesting one was

S. C., age nine, admitted March 1st, 1917. Complaints—Headache, difficulty in walking. Mental deterioration. History—Child was perfectly well until three years ago. In the summer of 1914 she had a temperature of 103° with headache and earache for one week. Two months later had a similar attack for four days. Since then she has had nightly headache. For two years had had difficulty in walking. Six months ago had difficulty in speaking, and her mother thought she was tongue-tied. For three years the mother says she has changed mentally, and has grown apathetic, irritable, and perverse. Examination showed normal pupils, slight squint and marked left choroido-retinitis. Spasicity of the legs and slight dysarthria. Reflexes in the legs and feet. She was given several injections of salvarsan and serum under

which treatment the eye condition improved and headache disappeared, but the spasticity of the legs showed no improvement.

A study of the symptoms in the series of seventy-four cases was very interesting. The variability of the symptoms of cerebrospinal syphilis is well recognized, and there is no disease in which one cannot depend upon any definite symptom to make a diagnosis. The most frequent complaint was headache occurring in forty-nine cases and it was the initial symptom in thirty-two of these cases. The headaches appears from a few days to five years before other symptoms but most often three or four months earlier. It is usually a generalized headache, but often is localized to the occipital region. According to text-books, the syphilitic headache is worse at night, but we have been impressed by the frequency in which it has been worse in the morning, shortly after the patient wakes up and it passes off by noon.

The next most frequent symptom was paralysis or paresis, occurring in thirty-four cases. If we sub-divide this symptom, we find that a transient paralysis occurred in seven cases and was the initial symptom in four cases; it was most frequent in the vascular type, five times in ten cases, the left arm being affected twice, the right arm three times, the right and left leg three times. Transient paresis occurred in eleven cases, being the initial symptom in two cases, and in our experience is an early local sign. It is also most frequent in the vascular type, occurring five times in sixteen cases, the right arm and leg each being affected three times, the left arm seven times and the left leg nine times. Progressive paralysis was seen in sixteen cases and was most frequent in the spinal type, four times in sixteen cases; the right and left arm each being affected five times, the right leg seven times and the left leg ten times.

The next most frequent symptom was involvement of the sphincters, which occurred in twenty-six cases. Incontinence of urine was present in twelve cases and is usually a late symptom; it was an early symptom in two cases of meningitis of the convexity. Retention of urine occurred in five cases and it also occurs late. Frequency and urgency of micturition was present in three cases. Incontinence of fæces occurred in six cases, and although constipation was a frequent complaint, we do not consider it an important symptom, because in many of this class of patients regularity of bowel movement is not considered in their ritual of life.

Optic neuritis was seen eleven times in sixteen cases of basal involvement. Diplopia was a complaint in seventeen cases, and eleven of these were of the basal type. The facial nerve was in-

volved in seventeen cases. Dizziness was a symptom in fifteen cases, and in nine of these was the initial symptom. Attacks of unconsciousness occurred in twelve cases being the initial sign on six cases. Vomiting was complained of in thirteen cases, being the initial symptom in three cases and most frequently in basal meningitis, twelve out of thirteen cases. Insomnia is often spoken of as an early sign of cerebro-spinal syphilis; in our series it occurred eleven times and was the initial symptom in three cases.

Other symptoms which were quite frequent were: dysarthria, eleven times; general mental deterioration, eleven times; acute mental symptoms, eleven times; ataxia, ten times; and convulsions, nine times. Altogether there were forty-seven different kind of symptoms.

Head and Fearnsides give a list of symptoms which may serve as danger signals in cerebro-spinal syphilis. They are:

1. Changes in personality and aptitude.
2. Disturbance of sleep.
3. Headache.
4. Shivering attacks.
5. Root lesions.
6. Abnormal reactions of pupils.
7. Disturbance of micturition.

A study of our table will show that our symptoms agree fairly well with this classification, except that we have not had any shivering attacks. Headache, we would say, is the most frequent symptom, occurring forty-nine times and it is the most common initial symptom. Changes in the mentality of a patient and disturbances of sleep are important early symptoms, but after headache, the next most frequent, in our experience, has been loss of motor power, either in the garb of transient paresis or absolute paralysis. Dizziness also is a complaint that must not be overlooked, and in every patient who complains of this annoying condition, syphilitic involvement of the nervous system should be considered.

No symptoms are pathognomonic of cerebro-spinal syphilis, but one must be on his guard when a patient comes complaining of symptoms which are commonly classed under the term neurasthenia.

The age of onset of symptoms in the series of cases was also an interesting study. In seventy-one cases the average age of onset was thirty-four years; the earliest age of onset occurred in the general meningeal type, being thirty years.

Age of Onset of Symptoms

Type	Average age	20–30	30–40	40–50	50–60
Vascular	32	8	4	2	0
Parenchymatous	37	0	5	1	0
Gen. Meningeal	30	8	2	2	0
Basal	33	14	7	1	1
Spinal	35	3	4	2	0
Total		33	22	8	1

A study of the time elapsing between the time of infection and the onset of symptoms showed that only one month had to elapse before the patient began to have symptoms of infection of the central nervous system and the longest period before the onset of symptoms was thirteen years. In this table we are speaking only, of course, of the interstitial type of cerebro-spinal syphilis, not of the parenchymatous type.

Type	Time elapsing between infection and onset of symptoms	Average time
Vascular	16 months—three years	5 years, 4 months
Parenchymatous	One—twelve years	6 years, 5 months
Gen. meningeal	1 month—eight years	2 years, 3 months
Basal	2 months—eight years	3 years, 2 months
Spinal	5 months—eight years	2 years, 8 months

Diagnosis. We do not intend to dwell long on the question of diagnosis. A careful history, as in all nervous conditions, is most important and a careful study of the list of symptoms present in our series of cases will give an idea of the picture complex this disease assumes. We do want to emphasize, however, the importance of an examination of the cerebro-spinal fluid. In every patient who complains of any of the symptoms we have enumerated and who is suspected of having contracted syphilis at some time of his life, or who admits having been exposed or having had gonorrhœa, a lumbar puncture should be done. It has lately been shown by many observers that a patient may have contracted syphilis under the guise of gonorrhœa, it is not necessary to have a chancre. There is no danger in doing a lumbar puncture provided the patient is kept in bed at least twenty-four hours afterwards. It may be done with the patient either lying down or sitting up, and not more than 10–15 c.c. should be withdrawn. The tests that should be done are Wassermann, colloidal gold, globulin and

cell count. No one of these tests is pathognomonic of cerebro-syphilis, but all of them are of value. The Wassermann test should be done in definitely known dilutions, and, if necessary, using as much as 2 c.c. of the fluid. There is no elimination of bacterial anti-bodies from the blood into the spinal fluid, and only a few chemical substances pass through the choroid plexus, so that a positive Wassermann test means actual involvement of the central nervous system. In the early secondary period, when a slight increase of cells and globulin are found, the Wassermann test is usually negative. Positive reactions in this stage mean a severe infection of the nervous system, a meningitis, with a marked pleocytosis and usually disappears rapidly under vigorous treatment. The Wassermann test is more apt to be positive in involvement of the cord than of the brain. In tabes dorsalis it is usually positive; in general paresis it is positive in both blood and spinal fluid. At this point let us say a word on the blood Wassermann. It is common to hear physicians say that the blood Wassermann was negative, therefore, the patient did not have syphilis. This leads to many disastrous results. Before having a Wassermann test done, the question of previous treatment must always be considered, as it is well known that vigorous anti-syphilitic treatment will cause a negative blood Wassermann. It is quite common to have a negative blood Wassermann and a 100 per cent. positive test on the spinal fluid, so that it is absolutely necessary to do a lumbar puncture before telling the patient that he has not syphilis.

Globulin. An increase of globulin is probably an evidence of vascular disturbances in the central nervous system; it indicates an abnormal transudation from the vessels. All the different tests should be done, Noguchi, Nonne, and Pandy, but in our experience the Pandy test is the most reliable. As Swift and Ellis say: "Its determination is especially important in the early stages of syphilis, since an increase of globulin in the spinal fluid may be the only evidence of invasion of the nervous system in a patient with primary or secondary syphilis, although it is usually accompanied by an increase of cells."

Pleocytosis. This is the estimation of the number of cells in the spinal fluid; over five cells are pathological. The number of cells is highest in secondary syphilitic meningitis, 1000–1500. In endarteritis syphilitica the number is usually normal and in syphilitic spinal paralysis the counts are low, 5–30. In tertiary cerebro-spinal syphilis the count varies between normal and several hundred according to the amount of meningitis.

All laboratory methods should be closely studied with the

clinical findings. In the words of Miller, "The value and interpretation of any laboratory method should always be based upon the most careful clinical study of the cases in which it is applied," and "any normal reaction in the cerebro-spinal fluid may be present or absent in any syphilitic involvement of the brain or spinal cord".

Treatment. The best treatment of cerebro-spinal syphilis is its prevention. This is best carried out by intensive treatment of primary syphilis. The introduction of salvarsan and its allied preparations has probably done considerable harm in the fact that one or more injections of it cleared up all symptoms, so that not only the patient but the physician was led astray. The need of intensive treatment can not be impressed too much upon the patient and the physician must understand that he must not discard mercury, as salvarsan without mercury will not cure syphilis. The recognition of an early involvement of the central nervous system is important, not only on account of the possibility of an early meningitic involvement, but also from the standpoint of prophylaxis of the later or more destructive lesions.

An early form of cerebro-spinal syphilis which is difficult to diagnose, because it gives the symptoms of cerebro-arterial sclerosis, is that type in which the disease involves the vessels in the form of endarteritis. The response of this type to treatment depends upon the extent to which the endarteritis can be favourably affected.

The figures of Mattanschak and Pilcz who studied, from 1880–1900, 4,134 cases of syphilis among the officers of the Austro-Hungarian army in connexion with the treatment of syphilis, are interesting:

Developed paralytica dementia	198—4·8 per cent.
" tabes dorsalis	113—2·7 "
" cerebro-spinal lues	132—3·2 "

	Effect of Treatment		Repeated
	No Treatment	One Course	Energetic
No. of Cases	100	134	924
Developed G. P.	25—25 per cent.	31—23·1 per cent.	30—3·2 per cent.
" tabes	11—11 "	16—11·9 "	25—2·7 "
" C. S. lues	3— 3 "	21—15·6 "	71—7·6 "

	Poorly Treated 1880–84	Better Treated 1895–99
No. of Cases	617	1139
Developed G. P.	60—9·7 per cent.	37—3·2 per cent.
" tabes	22—3·5 "	16—1·4 "
" C. S. lues	15—2·4 "	28—2·4 "

Another point to be emphasized is that in order to be sure that we have cured a case of syphilis, we must examine the cerebro-

spinal fluid, employing all the different tests, and no patient should be pronounced cured of syphilis until the spinal fluid has been negative after repeated punctures.

To-day there are several methods for treating cerebro-spinal syphilis.

1. Salvarsan intravenously alone.
2. Salvarsanized serum intraspinally—Swift-Ellis method.
3. Salvarsanized serum to which is added small quantities of salvarsan intraspinally.
4. Neo-salvarsan in small quantities and weak concentration intraspinally.
5. Mercurialized serum intraspinally.

All these methods have, more or less, been given a thorough trial by different workers, but enough time has not elapsed yet to be able to say whether one or any of them will be absolutely satisfactory. Every physician should, however, not be discouraged by the fact that he cannot give his patient the salvarsanized serum treatment as the intravenous method, in the opinion of many workers, gives as good results as the intraspinal method.

At the Royal Victoria Hospital we have only had experience with the intravenous method, the salvarsanized serum, and two cases of diluted solutions of mercury percloride intraspinally, which produced such severe after results that we did not dare continue it.

According to Swift and Ellis, autosalvarsanized serum contains 0·01 mg. or more of salvarsan per c.c. and a serum is definitely spirocheticidal, and the salvarsan is present in a colloidal combination with the serum, in which form it is probably more slowly diffused out of the spinal fluid, hence is longer in contact with the syphil tic exudates.

During the past year in the Royal Victoria Hospital we have treated thirteen cases of cerebro-spinal lues and six cases of paresis and tabes by the Swift-Ellis intraspinal method. In these cases we have given altogether one hundred and one intravenous treatments followed by eighty-eight intraspinal treatments. Two of these cases were previously treated in our wards, one as far back as six years.

We have withdrawn the blood generally one-half hour after the intravenous injection. In a number of instances we have withdrawn enough blood for two intraspinal treatments, two or three days apart. Our rule has been to give one treatment a week, supplemented by intensive potassium iodide and mercury treatment.

The two following cases are illustrative of the general result we obtained in treating cerebro-spinal lues with the intraspinal salvarsanized serum method.

Case No. 1. A. H., female, age twenty-one, stenographer, admitted January 2nd, 1917, complaining of headache. Her history was that she was exposed in December, 1915. In March, 1916, she had profuse leucorrhœa; in August, 1916, she had a sore in the vagina; in September, 1916, she had dizziness and unsteadiness for three weeks with impairment of hearing; on December 1st, 1916, headaches and sleeplessness began, and on January 1st, headaches became unbearable. Before admittance she had had at least six intravenous injections of salvarsan. Examination showed an extensor plantar response on the left side, with absent knee jerk on that side, no abdominal reflexes and impaired hearing. The Wassermann test on the blood and cerebro-spinal fluid was triple plus; the Lange gold test was 45554321000; the cerebro-spinal fluid was turbid, under pressure there was two hundred and thirty-three cells and a triple plus amount of globulin. Immediately after the first intraspinal treatment her headache improved and has never since been severe. After February 1st, she was up most of the time. After three intraspinal treatments her cerebro-spinal fluid was cloudy, there were fifty-eight cells, slight amount of globulin, the Wassermann test on both the fluid and blood was triple plus, and according to Lange's gold test there was reduction in the pareto-luetic zone. After six intraspinal treatments the spinal fluid was clear, contained four cells, slight amount of globulin and the Wassermann test was negative on both the blood and fluid. In this case, if we had not repeatedly examined the spinal fluid, we would have discharged the patient as cured because all symptoms had disappeared after the first three injections.

Case No. 2. N. K., male, age thirty, admitted August 17th, 1917. Complaints—Headache. History—October, 1915, chancre. Salvarsan nine days later, chancre disappeared. One month later, second salvarsan. Six weeks later the blood Wassermann was negative. Two weeks later sore throat and blood Wassermann was positive. December, 1915, third salvarsan. April, 1916, Wassermann test was negative but had a sore throat. April 20th, 1916, fourth salvarsan. Since then has had four salvarsans as well as mercury and potassium iodide. July 24th, 1916, began to have headaches in the evening and they have persisted ever since. Lately they have been worse in the morning, recurring intermittently during the day. They are mainly frontal around the eyes, but lately have become occipital in character. Hearing has been im-

paired for twelve years, but one week before admission became much worse. Physical findings—Entirely negative.

Course in hospital. After three intraspinal treatments, headache disappeared. September 22nd, eighteen days after admission, he left the hospital, but occipital headache began again almost at once, and he returned for eighteen days more. After one treatment headache disappeared. He had three treatments, and since then has been coming back for a day or two at a time for treatment. Altogether he has had twelve intravenous and ten intraspinal treatments, besides mercury both by the mouth and intramuscularly, and potassium iodide. Only after all this treatment was the spinal fluid clear, no increase in pressure, only a slight amount of globulin, six cells and the Wassermann test on both the fluid and blood was negative.

We have treated six cases of tabes dorsalis and paresis in this way with the following results : one case has been free from pain; one developed severe spasticity of the legs; one developed marked ataxia; one developed incontinence of urine and fæces; one became blind; one vomited for weeks, losing thirty pounds.

In conclusion, our results in tabes dorsalis and paresis have not been very successful, but as we have treated only six cases we do not feel that we would condemn the method altogether.

In acute lesions of the central nervous system the result has been different in all our cases as we have had very satisfactory, and in some cases remarkable, results.

Treatment must be early, intensive, and continued long after symptoms have disappeared, until the spinal fluid has remained negative to all tests for several months. Cases that relapse are those that have received inadequate early treatment.

No hard and fast rule can be established for treatment on account of the variation in individual response and the infinite variability of the extent of infection. One patient may require three treatments, another twenty treatments. Partial treatment is little short of criminal. We must learn to regard syphilis as we regard tuberculosis, a disease that is probably never cured but can be controlled and to which the body can be adapted for a long and useful life.

The question as to whether the intravenous method would not accomplish the same result as the intraspinal method is still unsettled. The very satisfactory results we have had in our acute cases, where often fairly complete intravenous treatment alone had been carried out, will lead us to continue this treatment in this type of case.

Venereal Diseases Prevention Act

SYNOPSIS OF THE VENEREAL DISEASES PREVENTION ACT OF ONTARIO

By John W. S. McCullough, M.D., D.P.H. (Tor.)
Chief Officer of Health, Ontario

THE following is a synopsis of an Act recently passed by the Legislature of the Province of Ontario, with the purpose of controlling venereal diseases.

The Act provides that any person under arrest may, if the medical officer of health believes that the person is infected with venereal disease, be required to undergo an examination in order to ascertain if he is or is not infected with this disease, which by the Act includes gonorrhœa, syphilis and chancroid. If the person so examined is found to be infected, he may be detained and treated. Physicians in medical charge of gaols and other places of detention are required to report within twenty-four hours, any persons confined who may be found to be infected.

If a medical officer of health has credible information that any person is suffering from venereal disease the officer may require such person to be examined, and if the person is infected, the officer may take steps requiring satisfactory treatment.

In order to prevent unjust action against a physician who makes an examination or report in respect to such cases, it is provided that such action can only be brought with the consent of the Provincial Board of Health.

Provision is made for right of entry to a house or premises by the medical officer of health or his deputy in the daytime for the purpose of enquiry or examination in respect to such cases. This provision is identical with the one in force in respect to other communicable diseases.

Hospitals designated by the Board are required to provide facilities for treatment.

No one but a legally qualified physician is allowed to attend upon or prescribe for or supply or offer to supply any drug, medicine, appliance or treatment to or for a person suffering from venereal disease or for the purpose of the alleviation or cure of such disease; the only exception to this being that a qualified chemist may fill the prescription of a physician for such purposes. The penalty for infringement of this provision is $100 to $500. A similar penalty is

provided against advertising in a newspaper, pamphlet or other periodical, any remedy or cure for these diseases. This penalty is also provided for anyone knowingly infecting any person with venereal disease.

Anyone making statements to the effect that a person has one or other of these diseases, except in case of disclosures made in good faith to a medical officer of health or physician in consultation, is liable to a penalty of $200.

Provision is made with the object of maintaining secrecy in respect to cases of this nature by those who have the administration of the Act.

The most important feature of the Bill lies, however, in the powers given the Provincial Board to make regulations in regard to the *forms* and *notices* to be used in the administration of the Act, in regard to the *remedies* to be used, respecting the *course of conduct* of the patient, in respect to the *distribution of information* concerning these diseases, the *regulation of treatment* in hospitals, etc., for *preventing* infection for *reporting of cases* by serial number, of *notices and placards* in public places, *imposing penalties* for infringement of regulations, *procedure in appeals* which may be used as a finality to the Board and the *method and extent of examination* of persons.

The Board is given power to manufacture and distribute remedies free or otherwise to local boards of health, physicians and hospitals.

Any expense in carrying out the provisions of the Act may be incurred by the medical officer of health or local board and such expense must be met by the municipality. The regulations under the Act are now in course of preparation and the law went into effect on July 1st, 1918.

While the effect of this law, which is a fairly drastic one, can scarcely be foreseen, it is reasonable to regard it as a decided step in advance. The restriction of practice in these diseases to qualified physicians and the prohibition of the advertising of quack remedies will, it is hoped, do much to eliminate the baneful effects of treatment by druggists and quacks, who not only do no good, but usually do a lasting injury to the victim of these diseases, not only by leaving them uncured, but, in addition, by giving them a false sense of security which allows of the transmission of disease to innocent parties. Reporting of the names of those infected, which does not seem to have worked well in practice elsewhere, is not sanctioned by the Act, but reporting by number is required.

Editorial

THE NURSING CRISIS

UNDER the heading "The Nursing Crisis", in the June number of *The Model Hospital*, Dr. S. S. Goldwater deals with a subject that is of more vital importance, if possible, to Canadians than to Americans. The American army is looking forward to difficulties in securing a sufficient number of nurses for its own use, and still leave sufficient for civilian needs. The fact that they are anticipating difficulties along this line will probably mean that before long they will meet this difficulty. We, in Canada, have seen this shortage of nurses becoming more acute yearly, and now, after four years of war, are still bemoaning our fate—and this shortage is more acute than ever before.

It is true that in our large General hospitals with their old established training schools, there has been little or no difficulty in keeping up the supply of nurses in training, but the smaller institutions are in very straitened circumstances.

Several plans have been suggested and discussed in Canada and the United States whereby the military needs will be met, and at the same time, the civilian hospital, large and small, be enabled to carry on without lowering the standard of its graduates.

1. An appeal to the young women of the country to enter the ranks of the nursing profession as a patriotic duty. In some localities this has succeeded; in the majority it has failed to meet the demand.

2. That the medical department of the army inaugurate training schools of its own. The effect that this would have on nursing standards after the war should dismiss it at once from our minds. The varieties of clinical material in the

army is too limited. Training schools for nurses cannot be established over night, and we feel sure that this proposal would never meet with the approval of those in a position to judge of the future of the nursing profession in Canada.

3. The Voluntary Aid Detachment. This appears at present the only solution. Let those who propose establishing army training schools for nurses devote their energies to establishing army training schools for voluntary aid workers. The civilian hospitals could be utilized for part of this training. In favour of this proposal one might quote:

(*a*) It is for the duration of the war only.

(*b*) The country would not be flooded with imperfectly trained "nurses" after the war.

(*c*) The class of women best suited for this work have time and money at their disposal. They are of the leisure class, and are not contributing at present to the efficiency of the nation or the success of the war.

4. This latter proposal has the disadvantage of not increasing the number of graduate nurses. Could not some system be worked out whereby the civilian hospitals increase the number of nurses in training, and at some definite period of their training, lend them for so many months to the militia. This would bring under discussion a number of difficulties mostly financial. The housing, board, clothing, text-books, etc., furnished by the hospital to these additional nurses in training would entail an expense that very few if any of our General hospitals could possibly undertake. But if it is the Government's earnest wish to more equally make the supply of nurses meet the demand, and still not detract from the standard of our graduate nurses for the future, this proposal will have many supporters if backed up financially by the Government.

DR. EMMANUEL PERSILLIER LACHAPELLE, President of the Dominion Medical Council, and of the Board of Health of the Province of Quebec, Dean of the

Faculty of Medicine, Laval University, for many years President of the College of Physicians and Surgeons of the Province of Quebec and of the Council of the Notre Dame Hospital in Montreal, Knight of the Legion of Honour (France), died in Rochester, Minn., in the Mayo Hospital, after an operation for symptoms obscurely indicative of a chronic cholecystitis. His health had been failing for some months, and on the advice of friends, he consented to an operation from which he rallied for a few days, but finally his strength succumbed during the late intense heat wave. Through his death, Canada loses one of her most courteous, most able, and most sympathetic personalities in the medical profession.

Born in 1845 at Sault au Recollet, one of the many historical spots in the neighbourhood of Montreal, of parents descended from the very earliest settlers of New France, he received his classical education in the Montreal College conducted by the Gentlemen of St. Sulpice, and his medical training in the School of Medicine and Surgery connected with Victoria University. The subject of hygiene early attracted his special attention, and a few years after graduation, he was appointed Professor of Hygiene in Laval University. His activity in all public matters connected with hygiene became marked, and to him, among others, Montreal owes a debt of gratitude for the active measures which were undertaken for the suppression of its serious epidemic of smallpox in 1885, and for his insistence at that time and ever since on the necessity for universal vaccination. Shortly after this epidemic was subdued a Provincial Board of Health was established and he was appointed its first president. The profession in Montreal has ever since recognized that owing to his firmness and tact many hygienic reforms have been carried out in this province that otherwise would have been impossible.

His professional activities were many. Elected in 1878 as a Governor of the College of Physicians and Surgeons in the Province of Quebec he retained an official connexion with

that body until very recently, for many years holding the office of president. Much of the best legislative work done by the college was enacted at his instigation and under his guidance. He gave much assistance to Sir Thomas Roddick in the framing and the passing of the Federal Medical Act through Parliament, and after its enactment as member of the Council, he took a prominent part in all its deliberations. Failing health prevented his attendance at its last meeting in June, when he would have sat as its elected president. As Dean of Laval Medical Faculty he rendered efficient service, and many generations of students will remember sympathetically the figure of its old Dean, always alert and kind.

His ability and willingness to render service to the community were only limited by his time and strength. He acted for many years as surgeon to the 65th Mount Royal Rifles. More recently he filled the arduous post of president of many national and benevolent associations, and took a very active part in all measures designed to prevent the spread of tuberculosis, and to instruct and assist those who were already suffering from the white plague.

At the very earnest solicitation of many friends, in 1909, he undertook the duties of one of the Controllers of the City of Montreal, a position to which he was elected by a large majority of citizens of all classes, but he found the task of cleaning the Augean stables too great for his strength. All recognized, however, that during his tenure of office his influence was exerted in favour of the progress, well being and honest management of civic affairs. Sir William Osler, speaking of Professor Virchow, and commending his forceful public spirit, remarks: "It must be acknowledged that in this country physicians are, as a rule, poor citizens, taking little or no interest in civic, state, or national politics." Canada can show, however, not a few exceptions to this statement, and among these exceptions, Dr. E. P. Lachapelle will always hold a prominent place as the embodiment of duty and devotion to the public welfare.

Extensively travelled, well read, of great breadth of mind, and of very courteous manners, intercourse and companionship with him were always most agreeable. To him can be applied with perfect fitness this appreciation of Matthew Arnold, "Lucidity of thought, clearness and propriety of language, freedom from prejudice, freedom from stiffness, openness of mind, and amiability of manner." A French Canadian at heart, but with all and above all, a Canadian, who always unwaveringly worked for the intermingling and advancement of the whole profession; through his death our French confrères have lost a sympathetic leader, and the profession as a whole in Canada has lost a sincere friend.

MEDICAL ATTENDANCE ON DISCHARGED SOLDIERS

THE Medical profession is being asked by the Invalided Soldiers' Commission, through the Canadian Medical Association, to accept the schedule fees promulgated by the Workmen's Compensation Board of Ontario as suitable remuneration for medical attendance on discharged soldiers where their illness is a result of wounds or sickness contracted on active service. If this is a temporary arrangement to be superseded at the end of the war by other plans, the profession of Canada will probably do all in their power to assist the government in this particular work. On the other hand, however, if it is to be a final solution of the question, we fear that only dissatisfaction and failure will result.

For many many years after the war is ended, the soldier who has received a disability as a result of service will be with us, and no doubt will require from time to time medical attendance in his own home, or in hospital, and this service will largely fall upon the civil practitioners. This being the case, the question is not so much one of War-time necessity, but rather of demobilization and subsequent periods. We believe, therefore, that the acceptance of a schedule of fees

that was prepared by the Workmen's Compensation Board of Ontario for accidents only will fail when applied to a question of the magnitude of the present one.

In a country as large as Canada the conditions of practice vary very much, and what might be considered a reasonable arrangement in one part might be quite unacceptable in another part.

In view, therefore, of the largeness of the question, would it not be better for the Invalided Soldiers' Commission, through its proper officers, to meet the Canadian Medical Association, or representatives of the various Provincial Associations, at an early date and give careful consideration to the problems from both sides, and out of such a conference, evolve a plan that will be satisfactory both to the Commission and to the Profession, and one that will be workable in all parts of Canada?

St. Cloud is another of the most efficient Canadian hospitals in France; it was given by the Canadian Government for the treatment of French poilus, and is under dual control. The French Government supplied the huts and the Canadian Government furnished them. Each hut is named after some province or city in Canada. Each hut averages twenty-eight beds, and 60 per cent. of the staff is French Canadian, while the full staff numbers two hundred and twenty-three. The officer in command is Lieutenant-Colonel Casgrain, of Windsor, Ontario.

At the evening session of the Moose Jaw Baby Welfare campaign, Mr. Dobson took up the question of Mental Hygiene. He explained the difference between the physically defective and the mentally defective, and urged for the latter, not a hospital, but a school of special education where the rest of the faculties can be developed, and the work can be

done by them that others have planned. He took pains to point out that there was no stigma attached to mental disease any more than to physical diseases. He deplored the feeble-minded being allowed to marry, and gave cases from actual life to drive home the law of heredity. From 60 to 80 per cent. of mental defectives are due to this cause. In Canada the number of feeble-minded is from three to five per thousand, which at that rate would give the Western provinces five thousand feeble-minded. He stated that in the province of Alberta there were one hundred mental defectives in the schools; in Ontario, seven thousand, and in the Dominion, fifteen thousand.

Dr. H. L. Abramson, who is widely known in connexion with his previous work with infantile paralysis in New York, arrived recently in St. John, to assume the charge of the Provincial Laboratory. He gave a very interesting account of the relation of the laboratory to sanitation and public health generally and the practical importance of its work. It had a dual function, one of a creative, the other of a routine nature; the latter consisted in the carrying out in a routine line the facts which had been elicited by the creative work. He instanced the work of Pasteur as creative in its function, and from it had come that great development of sanitary science which had broadened out and multiplied so that instead of having one laboratory for research work, we have now a multiplicity, each dealing with some special subject. He cited as examples of the product of the creative function, diphtheria anti-toxin, tetanus anti-toxin, anti-typhus vaccination, and tests for the detection of syphilitic serum, all of which play an enormous part in the maintenance of general public health to-day. A special method of detecting meningitis carriers had been discovered, and a combination of bacteriological and serological tests, by which isolation can now be specialized instead of making a general quarantine

necessary. Dr. Abramson emphasized the routine work of the Provincial Laboratory—the examination of milk and water for evidences of pollution or bacterial contamination; the examination of blood for infectious diseases; the taking of throat cultures to detect the presence of diphtheria. It would also be called upon to co-operate with the health authorities to watch over typhoid cases and prevent epidemics occurring through lack of precautions, and would be prepared to give anti-typhoid inoculations. In short, as he tersely concluded, "The laboratory was the corner-stone of the whole structure."

Colonel J. M. Elder, of Westmount, who succeeded Colonel Birkett, C.B., when the latter was invalided home, has just been appointed a consultant surgeon for the area of Rouen. There has been some criticism on the fact that some of the ablest physicians and surgeons were being allocated to administrative work, their special professional knowledge being lost to the hospitals. The appointment of Colonel Elder means that his professional abilities are again in constant exercise instead of being crowded out by administrative duties. The appointment is under the R. A. M. C., and may be taken as a tribute to the good surgical work Dr. Elder has done at McGill Hospital.

The new commanding officer for McGill Hospital is understood to be Colonel Lorne Drum, who until recently was A.D.M.S. for the 5th Division.

Obituary

DR. HUGH LANG

The death of Dr. Hugh Lang, of Granton, removes one of the typical country practitioners who was beloved by every one in the district. Dr. Lang was born near Birr, seventy-two years ago, and, after graduating from Toronto University, he settled in Granton for forty-seven years, where he practised his profession until the time of his death, which occurred suddenly, the cause assigned being apoplexy. The recent departure of one of his sons overseas, in the Royal Air Force, is thought to have weighed upon his mind, and possibly hastened his death. Two other sons, also physicians and residing in New York, survive him and one daughter. The funeral was held at Birr Cemetery.

Dr. Lang was a staunch Presbyterian. He was a Conservative in politics and was often approached with a view of his becoming a contestant for political honours, but he steadily refused to enter public life.

LIEUTENANT L. F. JAMIESON, R.A.M.C.

The accidental death of Lieutenant L. F. Jamieson, came as a great shock to his relatives, friends and patients, who were eagerly looking forward to his return this fall to resume his practice at Grimsby. Dr. Jamieson felt so keenly the call to overseas service that, in order more speedily to get into active service at the front, he left Canada at his own expense and went directly to England. There he immediately signed up with the Imperial Medical Forces and was granted a commission. After serving in England and France for a brief period, he was attached to the Egyptian Expeditionary Force and went first to Alexandria, and then on to Palestine. Here he was attached to the London Field Ambulance and placed in charge of the hospital in Jerusalem. Later he assumed charge of the advanced dressing station, being with the attacking forces of the Artillery Brigade, and seeing both service east and west of the Jordan river, in the crossing of which he is supposed to have been drowned.

Dr. Jamieson was born in Ontario thirty-four years ago and

graduated from the Toronto Medical School with high standing in 1908. He went immediately to Parry Sound, where he built up an extensive practice, and was well known in the whole district, having been made District Coroner. Later he went to Grimsby, Ontario, after taking a post-graduate course in New York, and here he resided until the call to overseas service came. Kind, sympathetic and unselfish, he has left behind him a memory of "the beloved physician." He voluntarily chose a service of self-sacrifice to comfortable ease, and death has gathered him to the heroic fraternity.

Dr. Thomas Simpson, the last member but one of the graduating class in medicine of McGill University in 1854, passed away on July 11th, in his eighty-fifth year. He was born in Montreal in 1833. After graduating with honours he, later, took post-graduate courses at Edinburgh, London, and Paris. Returning to Canada, he settled in Algoma district, where, for fifteen years, he was coroner, Indian agent, and Government physician to the Indians. In 1872 he returned to Montreal to be attached to the General and Western Hospitals. From 1880, for six years, he was professor of Bishop's College, University Medical School. He also served on a Government Commission to study typhoid fever at the same time.

Dr. Tancrede Fortier, of Beauce, died at the Hotel Dieu Hospital, Quebec, after a long illness.

Dr. W. M. Bruce, a well-known Toronto physician, died at his residence in that city at the age of sixty-six years.

Relatives have been advised of the death of Dr. H. Walker, at Kamloops, B.C., on July 12th. He was born at Ingersoll, and received his medical degree at Toronto University. Dr. Walker had been mayor of Wetaskiwin, where he resided for the last fifteen years, and medical superintendent and physician for the Indian Reserve.

Dr. Colin McLarty, a life-long resident of St. Thomas, died at his home there at the age of sixty-nine. He graduated from Toronto University, later qualifying as a member of the Royal College of Surgeons, London. He was also a Licentiate of the Royal College of Physicians, Edinburgh.

Miscellany

News

MARITIME PROVINCE

The sixty-fifth annual meeting of the Medical Society of Nova Scotia was held at Liverpool, N.S., on July 3rd, under the presidency of Dr. J. W. Smith, of Liverpool. In respect of the number of members in attendance and of the character of the papers read, the meeting was highly successful.

Amongst the papers read were:

"Functional diagnosis and general therapeutics of diseases of the heart," by Dr. W. S. Morrow, Montreal; "Some aspects of the venereal disease problem," by Dr. Gordon Bates, Toronto; and "A casualty clearing station in France," by Colonel F. S. L. Ford, C.M.G., C.A.M.C.

Professor Nicholls, Halifax, gave a paper on "Soldiers' sore throat".

Dr. George M. Murphy, of Halifax, was chosen president for next year's meeting, the place of which was decided as Antigonish; first vice-president, A. E. J. Forbes, Lunenburg; second vice-president, B. Francis, Sydney Mines. Dr. J. R. Corston, of Halifax, was re-elected secretary-treasurer.

NOVA SCOTIA

The annual meeting of the Association of Medical Health Officers of Nova Scotia was held at Liverpool, July 4th. There was a good attendance despite the fact that a large percentage of the physicians of Nova Scotia are on active service with the Army Medical Corps, so that those who remain at home are very busy. An interesting and practical programme awakened keen interest and led to very instructive discussions. Dr. W. B. Moore, M.H.O. of Kentville, was elected president for the ensuing year.

The Public Health Act was amended during the last session of the provincial legislature by the addition of a number of sections

dealing with the venereal diseases. The new legislation provides for the reporting of venereal diseases, for the examination of suspects, for laboratory diagnosis and hospital treatment, prohibits treatment by any except qualified medical practitioners, prohibits advertising of quack remedies, etc., and makes it an offence for any venereally infected person to suffer any act which may lead to the infection of any other person.

A co-operative committee for veneral control in Military District No. 6 has been formed in Halifax, with the provincial health officer (Captain W. H. Hattie, A.M.C.) as chairman, and other medical officers representing the army and navy as well as prominent citizens occupying other offices. The military authorities of Military District No. 6 have been dealing with this matter for some time, and the venereal incidence in enlisted men is now very small, although numerous cases of infection are still being found in men called up under the Military Service Act. This is in keeping with the general experience that venereal disease is more common amongst civilians than amongst soldiers.

NEW BRUNSWICK

At the convention of the New Brunswick Medical Society most instructive papers were read by Dr. A. E. Macaulay and Dr. H. L. Abramson, of St. John, and one prepared by Dr. W. D. Rankin, of Woodstock, was read by the secretary, as Dr. Rankin was unable to be present. The session just closed was one of the most successful in the thirty-eighth year of the history of the society.

ONTARIO

Dr. H. B. Anderson has been appointed by the Minister of Education, the Hon. Mr. Cody, Chief Medical Referee for the Ontario Branch of the Inspectors' and Teachers' Superannuation Fund Commission.

The annual meeting of the Ontario Medical Council was held June 25th to June 27th, 1918. The officers elected were: president; Dr. R. Ferguson; vice-president, Dr. A. T. Emmerson; registrar, treasurer, Dr. H. Wilberforce Aikins; solicitor, H. S. Osler, Esq.,

K.C.; auditor, James F. Lawson; stenographer, George Angus; prosecutor, John Fyfe.

The following medical colleges in the United States were added to the list of accredited colleges in Ontario:

1. Hahnemann Medical College of Philadelphia.
2. University of Michigan Homœopathic Medical School.
3. Boston University School of Medicine.

The Council passed a resolution asking the Militia and Defence Department to "reconsider the regulations relating to medical students under the Military Service Act".

The depletion of the profession throughout the Dominion by the demands of the Military Services and the reduction of the number of students in attendance at medical schools by voluntary enlistment and conscription has created a situation which must result in a complete breakdown of medical services, both civil and military in the near future.

The Council desires to represent to the Department of Militia and Defence the necessity of immediately making provision to continue the education of a sufficient number of students.

The Council is of the opinion that young men who completed their preliminary education and entered upon the study of medicine before attaining military age should be permitted to continue professional studies, and that this policy should be applied to the matriculation classes of this and subsequent years.

In January last the British War Office intimated that Canadian medical students who had completed one year of study and who were in any branch of military service overseas would be permitted to return to Canada to resume their studies. In view of the gravity of the situation, this Council requests that this privilege be extended to men who are in service overseas, and who prior to enlistment, had completed matriculation in medicine or had entered upon arts or science courses, in preparation for the study of medicine. It is suggested that the staff of the Khaki University assist in the selection of these men.

The following resolution was passed: "That whereas the medical examinations of the manhood of Canada, for military service, reveals a serious percentage of physically unfit, varying from 40 per cent. to 70 per cent., this Ontario Medical Council is of the opinion that some form of supervision of the health of the country should be instituted by the state, and suggests that this matter be referred to the proper departments in the Dominion and Ontario Governments."

It was decided to ask the Federal and Provincial Governments to modify the Patent Medicine Act, so as to prevent the misbranding of proprietary medicines, and the publication of "fake" testimonials, etc.

The Council also dealt with the question of the relations between its members and the provision of the Ontario Temperance Act. A report of this was published in our August number.

QUEBEC

THE seventh annual convention of the Public Health Services was marked by an unusual number of interesting addresses. The programme lasted for two days. The features of leading importance were: industrial hygiene; public health in the province of Quebec; duties of municipalities in regard to public health; help given to municipalities by the district health officers; the health department in a small municipality; venereal diseases; deficiencies in public health administration; the public health nurse; statistics on cancer; infantile hygiene; the laboratory in epidemiology; the anti-tuberculosis organization of the municipal health department of Montreal; the inauguration of the anti-tuberculosis league of the county of Temiscouata; prevention of tuberculosis; hospitalization of the tuberculosis patient; anti-tuberculosis clinic; and "Microbes, how they grow, live and die," with lantern slides, by Dr. A. Valée, Quebec. Dr. J. A. Jarry, Montreal, closed the convention with an address, "What we have done, What we are doing, and What we could do at the Bruchesi Institute."

THE result of the quarterly examinations of the provincial Pharmaceutical Association, conducted by the preliminary board of examiners resulted as follows: admitted as students of pharmacy, eight; passed on letters, seven; passed on sciences, two; fourteen passed on all subjects but one, and will have to present themselves at the next examination. The examiners were professors J. O. Casgrain and I. Gammell, of the Montreal High School, with J. E. Barnabe as supervisor and Victor Giroux, supervisor for Quebec and district. The final examinations will be held at Laval University, Quebec.

A DIRECT result of the Baby Welfare Exhibit, held in Montreal two months ago has been an increased attendance at all the centres, which has rapidly risen to two-and-a-half per cent. In May, six

thousand, five hundred individual feedings were distributed, and four hundred and thirteen mothers attended baby clinics.

THE relief fund campaign for Notre Dame Hospital closed with a total of $267,153.50. The directors of the hospital subscribed among themselves $10,000. By obtaining more than the $150,000 mark, the fund secures an additional subscription from Sir Rodolphe Forget for $100,000.

THE Medical Council of Canada, at the concluding session of its annual meeting at Ottawa, elected the following officers for the current year: honorary president, Sir T. G. Roddick (re-elected); Montreal; president, Dr. R. Eden Walker, New Westminster; vice-president, Dr. J. C. Connell, Kingston; registrar, Dr. R. W. Powell, Ottawa (re-elected); general counsel, F. H. Chrysler, K.C., Ottawa; auditor, G. L. Blatch, K.C., Ottawa.

THE report of the education committee contained the formation of boards for the examinations in Halifax and Montreal in October, 1918, and in Toronto and Winnipeg, in June, 1919. The council is a legislative body created under the Canada Medical Act for the purpose of setting a standard whereby the doctor securing the L.M.C.C. qualification is enabled to practise in all provinces of the Dominion. The curriculum of the council is intended to be a test of a man's fitness for a high qualification after he has secured his M.D. degree from his university.

AT the last convocation of Laval University, eighteen students of the faculty of medicine were awarded doctor's diplomas. Six of these passed with distinction and six with great distinction. The Leblanc silver medal was awarded to Alexander Sirois, and the bronze medal to Antoine Paradis.

BRITISH COLUMBIA

THE first convention of British Columbia hospitals was held in Vancouver this summer. It was an event of marked importance. Seventy-two hospitals were invited to send representatives and practically all responded. The convention opened in the auditorium of the University of British Columbia, June 26th, and lasted three days. Dr. C. H. Gatewood gave the opening address and at its

conclusion he was unanimously elected chairman of the convention, and Miss McKenzie, of the Victoria Jubilee Hospital, was nominated honorary secretary. The address to the delegates was delivered by Dr. MacEachern, superintendent of the General Hospital. More than a score of interesting papers and addresses from prominent speakers were presented in the five business sessions. Among the subjects down for discussion were: "The Standardization of Nurses' Courses of Study in British Columbia and the Affiliation with larger Training Schools"; "Financing Hospitals"; "The Hospital Pharmacy and the Hospital Laboratory"; "Problems of the Hospitals in Outlying Districts"; "Infectious Diseases and the Control of the Same"; "Hospital Architecture," etc.

Dr. S. S. Goldwater has been designated by Surgeon-General Rupert Blue as a "consulting expert in the public health service", to act in the selection of a site for the establishment of a home for the care and treatment of persons afflicted with leprosy. Associated with Dr. Goldwater in this task will be Surgeon G. W. McCoy, director of the Hygienic Laboratory, and W. C. Woodward, health officer, District of Columbia.

The Vancouver General Hospital shows a remarkable development in the last five years. In August, 1913, the patients numbered two hundred and twelve and the staff one hundred and eighty. To-day, patients number about twelve hundred and the staff five hundred and forty. Expenses are $60,000 a month and six thousand meals are served daily.

The annual report of the Royal Jubilee Hospital was given at the twenty-eighth annual meeting of the directors of the institution on June 28th. The num ber of patients treated in all departments was 2,010, showing an increase of ninety-one. The daily average number of patients was one hundred and fifteen, and the total number of days' treatment was 42,138, an increase of 3,935 days over last year. Receipts for the year ending May 31st, 1918, were shown to total $44,258.47. The treasurers' cash statement for the year amounted to $101,558.69. Hospital bequests during the year to the amount of $5,800, were gratefully acknowledged.

ARMY MEDICAL SERVICES

Colonel A. E. Ross, M.P., for Kingston, has been appointed Director of Medical Services for the Canadian section, general headquarters, in France. He has also been promoted Brigadier.

The assistant medical directors for the territorial units carrying out the work of the Invalided Soldiers' Commission have been appointed by the Director of Medical Services, Lieutenant-Colonel F. McKelvey Bell, as follows: Maritime Provinces, Major Dugald Stewart; Ontario, Captain Edward Ryan; Manitoba Major K. McIvor; Saskatchewan, Captain W. C. Arnold; Alberta, Major D. R. Johnson; British Columbia, Major A. P. Proctor.

A new medical board of review has been appointed for the Toronto military district, which will now have four such bodies. The president of the board, Lieutenant-Colonel Henry Bascom, will be assisted by Captain C. C. Fissett, of Brantford, and Captain R. J. Gibson, of Sault Ste. Marie. The work of the new board is to assist in re-examination of men who are being constantly called out by the registrar.

Captain C. Mackay has been appointed Medical Director in New Brunswick of the Invalided Soldiers' Commission.

Captain B. L. Guyatt has been appointed temporary O. C. of the hospital at Camp Borden.

Miss P. Courtice has been appointed Matron of the Military Hospital at Whitby, Ontario. She went overseas in 1915 and served for twenty-two months at Salonika.

Dr. H. Williamson is gazetted as major in the C.A.M.C. after three years' service in the corps overseas.

Captain T. Harold Crews has been transferred from the Imperial army to the C.A.M.C., owing to the great demand in Canada for returned medical men with overseas experience. He has just arrived from France.

Lieutenant-Colonel Le Bel, recently in charge of one of the largest of the main hospitals at St. Cloud, has returned. He was awarded the Legion of Honour by the French Government, in recognition of his efficient organization work in the French army, although he was in the British and Canadian services. The British Government donated Colonel Le Bel's services to the French Government, together with the gift of the St. Cloud Hospital.

Lieutenant-Colonel C. E. Edgett has been promoted to the head of the Canadian Veterinary Department overseas, his jurisdiction extending to England as well as to France.

Dr. R. J. Manion has recently issued a volume "A Surgeon

in Arms," (Appleton's, New York; McLelland, Goodchild & Stewart, Toronto). Dr. Manion, as a Captain in the C.A.M.C., won the M.C. for gallantry at Vimy Ridge. Since then he was elected M.P. for Fort William and Rainy River constituency as a Unionist. With Dr. McGibbon, of Muskoka, he is one of the two medical M.P.'s who have won the Military Cross.

THE following Nursing Sisters of the Canadian Army Medical Corps have been awarded the Royal Red Cross by the King:

Miss Mabel Lindsay, Miss Mary B. Hubbs, Miss Theodora McKiel, Miss Alice Grindley. Royal Red Cross of the Second Class: Miss Elizabeth Campbell, Miss Mae Pritchard, Miss Edith Lumsden, Miss Jean Sword.

Nursing Sister A. B. McDonald has received a decoration in bronze from the French Government for faithful and heroic services to wounded soldiers.

Nursing Sister A. M. Cameron has been awarded the military medal for bravery and devotion to duty under enemy hospital bombardment.

The Military Medal has been awarded to Miss Evelyn Gordon Brown for conspicuous bravery under fire. She was the first woman to join the Canadian Army Service Corps, and is a member of the First Aid Nursing Yeomanry Motor Ambulance Convoy.

The Military Medal has been awarded to A. Gillespie, C.A.M.C.

DR. LAWSON, a graduate of Toronto University, who has been serving overseas in the C.A.M.C., has been admitted to membership in the Royal College of Surgeons in England.

DR. W. W. WHITE has been granted the temporary rank of Lieutenant-Colonel with the Canadian Army Medical Corps and will act as consulting surgeon with the department of medical services in military district No. 7 under Lieutenant-Colonel Jost.

THE Canadian Commissioner waited on Sir Robert Borden when in London, England, and presented him with the official record from the city of Joinville-le-Pont in which is situated the hospital recently presented by the Canadian Red Cross to France. The record set forth the resolution of the mayor and councillors that in testimony of respect, affection and gratitude to Canada, a street at present known as the "Rue des Corbeaux" should thereafter be designated the "Avenue des Canadiens".

The return of the Hon. Dr. Beland to Canada recently, after his long imprisonment in Germany, was heralded with scenes of great public rejoicing. In the early days of the war, Dr. Beland ministered untiringly to the needs of the wounded, and could have retreated with the Belgian forces, but he preferred to stay by his patients. As a result he spent three years in confinement, mostly in the city fortress in Berlin, where he assisted the regular physician in the treatment of other prisoners.

MEMORIALS

A beautiful tablet to the memory of Lieutenant-Colonel John McCrae is to be placed in the Royal Victoria Hospital, Montreal, and contains the following inscription:

"In memory of Lieutenant-Colonel John McCrae, assistant pathologist and assistant physician, 1904–1917, chief of the medical division, No. 3 McGill Canadian General Hospital, Boulogne, France, consultant of the First Army. Died on active service in France, January 28th, 1918. Then follow the stanzas of Colonel McCrae's now famous poem, 'In Flander's Fields'."

The Regina Medical Association will erect a tablet in the local General Hospital to the memory of Dr. E. E. Meek, of Regina, who was killed in France while operating on a wounded soldier in a Red Cross hospital bombed by German airmen.

CASUALTIES

Killed in Action

J. S. Morrison, C.A.M.C., St. John, New Brunswick

Died on Active Service

Nursing Sister Marion Overend, Peterboro, Ontario
Nursing Sister Ada Janet Ross, Edmonton
J. H. Webb, C.A.M.C., Toronto
W. M. Robb, St. John, New Brunswick

Medical Societies

No. 1 CANADIAN GENERAL HOSPITAL CLINICAL SOCIETY

Meeting January 17th, 1918

PRESENT the following officers: Majors Gwyn, MacDermot, Ower, Ruttan; Captains Baragar, Bunn, Forsyth, Logie, MacKay, McAskill, McPherson, Howes, More, Smith, Thomas, Wade, and a number of visitors including Colonel Raw, Major French, Captain McDonagh.

Programme

Case No. 1. *Specimens of lung and thrombus in femoral vein from a case dying of broncho-pneumonia and empyema, secondary to an infected thrombus of the femoral vein.* Demonstrated by Major Ower.

A case of five weeks' duration, deep, but of late, clean wound of the mid-thigh, in which persistent fever was followed by signs of broncho-pneumonia of the left side, subsequent pleurisy and empyema of the right side, which was opened and drained; beginning empyema of the left side, which had not been opened since it had developed in the last two days of a moribund existence. Of most particular interest was the thrombus in the femoral vein, in which streptococci could be demonstrated, and an illustration of which will appear later.

In the lungs could be demonstrated areas suggesting softened infarcts, and a diffuse broncho-pneumonia. The heart was enlarged; the musculature pale; the chordæ tendineæ much flattened; kidneys were enlarged, pale, and presented the appearance of an organ in an advanced state of parenchymatous degeneration.

Case No. 2. *Case of diffuse pigmentation of the skin and mucous membranes.* Demonstrated by Captain Howes.

Captain Howes in describing the case, stated that the pigmentation now was regular and distinct on hands and face. It had begun and was noticed two years ago. Previous to joining

the army, he had been at work as a sailor on a tug-boat, and from his description seems to have suffered neither from asthenia nor gastro-intestinal symptoms, two very important features in diagnosis of Addison's disease. There is at present some asthenia, following a short febrile attack, but the patient is bright, and eats heartily. The skin of the body is universally browned, and splotched with patches of deeper brown, and scars of scratch marks, due to lice; and body pigmentation must be considered as coming from this source.

There is no intensification of the pigment round the nipples or under the armpits. It has increased around the waist. The skin of the hands and face is the brownish hue described in Addison's disease, and in addition, there is a suggestion of cyanosis of the lips, nose and eyes. It is to be especially noted that the body pigmentation is clearing up with local cleansing, while the pigmentation of face and hands is evidently deepening.

On the gums, hard palate and inside of cheeks are many flecks of brown pigment. There is no anæmia nor deviation of the blood count from normal; urine shows no sugar or albumen. The case is of interest more as being one that is probably not Addison's disease.

Colonel Raw, of Liverpool Merchants Hospital, discussed the case, and congratulated Captain Howe on the way in which it had been presented. He was inclined to believe that the case was not one of Addison's disease, but was either due to a tuberculosis of the peritoneum, involving the sympathetic system, or to local infection of the skin from lice.

Major Gwyn detailed the many conditions which might give rise to pigmentation of the skin, and commented on the absence of of general symptoms, such as asthenia and gastro-intestinal symptoms, without which a diagnosis of Addison's disease was hardly possible.

Case No. 3 (a). *Report on the progress of the case of cholecystitis due to Para-Typhoid B. infection.* By Major MacDermot.

(b) *Case of acute appendicitis.* Reported by Captain Logie.

Captain Logie in speaking, said he was merely giving the details of a case of acute appendicitis which had come to operation, and had done well. Clinically the main feature had been intense cutaneous hyperæsthesia about and below McBurney's point, with a minimum amount of rigidity. The patient had entered the ward four hours before.

The white blood count was high, 15,000; temperature and pulse rate steadily increased while, the local signs persisted, and vomiting took place. Operation showed a perforated appendix, and considerable free fluid in the abdomen. Patient has done consistently well since operation.

Case No. 4. *Discussion on the case of enlarged spleen, presented at the previous meeting.*

Captain Logie in presenting the case for the second time, remarked that the only change to be noticed was a diminution in the amount of albumen in the patient's urine, and a disappearance of the physical signs of ascites. The patient is feeling more comfortable; little or no change to be noticed in the size of the spleen. He was now under regular anti-syphilitic treatment, in the shape of mercury inunctions and potassium iodide.

Captain McDonagh in discussing the case, remarked upon the fact that too many cases of Banti's disease did not appear as a clinical entity. A large number of these cases eventually proved to be due to tuberculosis and syphilis. He himself had seen cases in which both hereditary and acquired syphilis were demonstrated to be the cause of the enlarged spleen and the peculiar type of anæmia.

Captain Alexander MacKay cited a similar case occurring in his private practice. The Wassermann reaction had been positive. There had been severe hæmorrhage from the stomach, and the case had afterwards gone to the Mayo Clinic in Rochester, Minn., where the enlarged spleen was removed. The patient had made a good reovery.

Major Ower described enlarged spleens from the pathologist's standpoint, and enumerated the various histological alterations seen in the many disorders associated with spleno-megaly.

Major Gywn discussed the case at length, and dwelt upon the development of the idea that there was a type of disease beginning as the so-called splenic-anæmia, and ending as the condition now spoken of as Banti's disease. He described the various clinical states associated with enlarged spleens, and the differential diagnoses, as far as could be established, between the various conditions. He stated that, excluding the large spleens due to cysts or infarcts or tropical diseases such as malaria and kala-azar; excluding the enlarged spleens of pernicious anæmia, of leukæmias, which are usually to be recognized by their associated blood condition; excluding the spleens of Hodgkin's disease, known or

recognized by its associated condition in the glands, and its histological picture; excluding the enlarged spleens secondary to cirrhosis of the liver, to tuberculosis and late syphilitic infection, there seeemd to remain still the conditions spoken of as splenic-anæmia, the anæmia infantum pseudoleukemica, and the syndrome spoken of as Banti's disease. Whether these were all one and the same condition, the one being the disease as seen in infants and children; the other being the disease as seen in adults, is open to question, but such is the belief held by many clinicians to-day.

It was, he stated, no easy matter to make the diagnosis at any time, and case after case of anæmia with enlarged spleen had been thrown out of the category, owing to some existing cause, such as syphilis or thrombosus of the splenic veins being found. Of recent date has been the discovery in several instances of a persistent umbilical vein, which, by throwing extra work upon the portal system, had sooner or later caused endophlebitis of the splenic vein, an subsequent changes leading to enlargement of the spleen and anæmia. However, it had seemed to be well established, that the disease spoken of as splenic anæmia did in many cases run a chronic course, which terminated in a condition giving the picture of cirrhosis of the liver, and showing pathologically a well marked and apparently true cirrhosis. Syphilis probably did not account for all these cases. Clinically there were four well marked features of the disorder. (1) Its beginning as a splenic anæmia. (2) Its chronicity and division into stages. (3) The final development of the symptoms and pathological evidences of cirrhosis. (4) The fact, that, performed before the final stages of the disease, splenectomy has effected a cure.

The meeting then adjourned.

The work on a thousand-bed hospital, to be erected at Ongwanda, is to commence at once, and it is proposed to erect at Barriefield camp two casualty huts, each capable of accommodating five hundred men. The hospital, which will eventually be converted into a soldiers' home, will have accommodation for seven hundred beds. There will also be a nurses' home, an isolation hospital, and a building for the treatment of certain diseases.

The Canadian
Medical Association Journal

Vol. VIII. OCTOBER, 1918 No. 10

PHYSIOLOGY OF THE INTRACRANIAL CIRCULATION

By J. J. R. Macleod, M.D.

Department of Physiology, University of Toronto

CONSIDERED from a physical standpoint the circulation through the brain has been recognized for long to be unique in comparison with that of any other organ or tissue in the body with the exception of the bone marrow. Encased in the rigid cranium, the volume of the brain cannot, like that of other vascular areas, expand and contract in proportion to changes in the blood supply; neither can the calibre of its blood vessels become altered, unless some special mechanism magenist whereby a part of the cranial contents are quickly expelled from and aspirated into the rigid case. In a general way, the physical conditions of the intracranial circulation are similar to those existing in a flask full of water and having a thin-walled rubber tube suspended in the water with its free ends connected with glass tubes passing through the stopper of the flask. If fluid be made to circulate through the tubing, no change in the calibre can be produced by altering the pressure of inflow; but the rate of discharge from the other end of the tube will be proportionate to the pressure. Although the tubing itself is readily distensible and elastic, these properties are entirely annulled by the incompressible fluid in which the tube is suspended.

If any expansion or contraction of the tubing as a whole is to occur, provision must be made for changes in the volume of fluid in the flask by inserting in the stopper a third tube connected with

Being part of a symposium given at the Medical Week at Hamilton, May 31st, 1918.

an overflow flask, and in applying this second model to represent the circulatory conditions as they exist in the brain, the question arises as to whether the cerebro-spinal fluid which lies in the large subarachnoid spaces at the base of the brain and in the ventricles, by communicating through the foramen of Magendie with the spaces surrounding the spinal cord, may not be capable of functioning as the overflow fluid. This is at least conceivable, especially when one bears in mind that some outflow is also possible along the sheaths of certain of the cranial nerves. Recent investigation has, however, clearly demonstrated that under normal conditions the amount of cerebro-spinal fluid is too limited to make it of any significance in this connection.

Although it is therefore improbable that the vessels as a whole could expand or contract, it is still possible that some provision might exist by which extra room could be made to allow of *localized* dilatation of certain parts of the vessels. The veins, for example, might contract in proportion as the arteries dilated and the possibility becomes all the more likely when we consider that because of the great capacity of the cerebral veins, their lumina might be considerably constricted without any serious obstruction being offered to the blood-flow through them. Such a reciprocal dilatation and constriction of the proximal and distal halves of a thin-walled rubber tube suspended in water in a closed flask can be demonstrated provided some resistance be inserted between the two halves. This resistance would be represented in the intracranial vessels by the capillary area. It is impossible to say to what extent this reciprocal mechanism between arteries and veins may prevail, but in any case it cannot well extend beyond the cerebral veins to the sinuses, since these are partly embedded in the cranium itself and are protected by relatively thick membranes on their free sides. The mechanism may be employed for permitting the arteries of a local area to expand, but it cannot obtain over any large area, since otherwise the total outflow of blood from the sinuses through the jugular foramen would be curtailed, which we know to be contrary to what actually occurs when the arterial pressure is raised, and which moreover would be highly detrimental, since it would cause self-strangulation of the intracranial blood-flow.

These physical considerations lead us to expect that there cannot be any dilatation or constriction in the intracranial vessels which is comparable with that which occurs in other vascular areas, although it may take place to a degree which is limited by the extent to which the cerebral veins can be passively contracted or

expanded without curtailment of the blood flow. Acting to this extent, the dilatation produced in the arteries by each cardiac systole accounts for the rise in pressure which occurs simultaneously in the venous sinuses (as measured in the torcular Herophili), but it is unlikely that the amount of blood supplying the brain will be determined by local dilatation or constriction of the blood vessels, as is the case, for example, in a gland or muscle. Of this we are certain, that the total volume of blood within the brain case at any given moment can undergo no considerable change. Provision for more or less blood must therefore be afforded by changes in the velocity of flow.

We must now proceed to test these hypotheses by physiological experiment, for, if they are found to apply to the intracranial circulation, the conclusion becomes inevitable that changes in the total blood supply to the most important organ in the body are dependent not on any local adjusting mechanism in that organ itself, but upon conditions prevailing in other parts of the body, with the possibility that a local vasodilatation may be made possible by a secondary compression of neighbouring venules, or perhaps even by an active constriction of the arterioles of neighbouring inactive centres.

The questions of greatest practical importance are, therefore, as follows: (1) What determines the intracranial pressure, and how does this vary during each heart beat? (2) If there can be no change in the actual volume of blood in the vessels as a whole, what provision is made to provide changes in blood supply with varying degrees of activity of the brain, and how are these changes brought about? (3) Is it possible without change in the total volume of blood in the brain for certain vascular areas to expand at the expense of others that correspondingly constrict?

The pulsations of the brain and the cause of intracranial pressure. Examination either of the fontanelles in an infant or of the surface of the brain exposed by trephining shows distinct pulsations, but this does not prove that similar pulsations occur in the intact brain case, for the absence of a part of the cranial wall might be responsible for the pulsation. The presence or absence of pulsation must be sought for in the still rigid brain case. This has been done by closing a trephine hole by a glass window through which the cranial contents can be seen when strong illumination is used: pulsations of the vessels are clearly visible. To determine the exact relationships of the pulsations, the trephine hole is connected with a delicate recording tambour by screwing into it a brass tube closed at

its inner end by a thin rubber membrane. It has been found that the arteries expand somewhat with each cardiac systole, and that there are further expansions with each expiration, but not with inspiration, as is the case in other vascular areas. The room for the cardiac expansions is no doubt provided mainly by compression of the cerebral veins, thus causing the blood within them to exhibit corresponding waves of pressure. The room for the expiatory expansion is possibly provided in part at least by movement of cerebro-spinal fluid into the spinal canal. The reason why expiration and not inspiration causes the increase in volume is that there are no efficient valves between the right side of the heart and the cerebral veins. This allows the expiratory rise in venous pressure which is well known to occur in the former to be directly transmitted to the brain.

This brings us to the second part of our first question: What determines the intracranial pressure? To answer it we must know something of the method by which the pressure is measured. This has been most successfully done by Leonard Hill, who devised an instrument called the cerebral pressure gauge, consisting of a brass tube closed at one end by rubber membrane and screwed into a trephine hole. The outer end of the tube is joined to a narrow glass tube connected with a pressure bottle. The whole system is filled with fluid except for a minute bubble of air in the narrow glass tube. Any changes in pressure in the brain cause corresponding movements of the bubble, and the magnitude of the change is measured by readjusting the pressure bottle so as to bring the bubble back to its original level. It has been found that the pressure may vary from zero to 50 mm. Hg. (as in strychnine convulsions), and that these variations depend entirely on circulatory conditions, there being no compensatory mechanism by which the pressure is kept constant. The brain continues to functionate in normal fashion independently of pressure. The average pressure under physiological conditions is 100-130 mm. H_2O.

The intracranial pressure varies directly with the venous pressure within the skull, and only passively follows changes in the pressures in the arteries and veins of the systemic circulation. This implies that the efficiency of the cerebral circulation will be dependent very largely upon alterations in the capacity of the splanchnic area, the greatest reservoir of blood in the body. By actual measurement it has also been found that:

1. The pressure within the lateral sinuses of the brain (measured by connecting a tube and manometer with the torcular Hero-

phili) varies absolutely with the intracranial pressure. It therefore exhibits pulsations which mirror precisely those observed in the cerebral pressure gauge.

2. Both these pressures passively follow changes in the pressure in the right auricle. They also run more or less parallel with changes in arterial pressure, and there is never any change in either of them which cannot be traced to some general circulatory condition.

The reason why the intracranial-venous and the intracranial (cerebral) pressures do not vary absolutely with the arterial is that they "are equal to the arterial pressure minus the unknown resistance which opposes the tension of the vascular walls on the arterial side"—(Leonard Hill). This elastic tension is so great that it reduces the pressure to millimeters of water instead of millimeters of mercury.

A few of the many experiments performed by Leonard Hill and others will serve to prove these far-reaching conclusions:

1. In asphyxia produced by cessation of the respiratory movements in a curarized animal, the cerebral venous pressure at first falls with fall in the systemic pressure and then rises as the arterial hypertension sets in. In the last stage, however, although the arterial pressure is quickly falling, the venous pressure rises and with it the cerebral venous pressure.

2. During administration of ether, alterations in cerebral pressure become marked only when there is extensive muscular movement or hyperpnœa. Chloroform, on the other hand, by acting more directly on the heart so as to produce a fall in arterial and a rise in venous pressure, causes at first a decided rise in cerebral pressure and later a fall following the development of decided arterial hypotension.

3. Amyl nitrite, injected into the jugular vein, causes at first a rise in venous pressure and therefore in cerebral pressure. Later, however, marked arterial hypotension develops, and the intracranial pressure declines.

4. During epileptic fits induced experimentally by excitation of the cortex, there is a rise in venous pressure and correspondingly in intracranial pressure. In the more violent convulsions produced by absinthe, there is very little change in systemic venous pressure, while the arterial pressure shows extreme variations, with which the intracranial pressure runs parallel. With adrenalin, where both arterial and venous systemic pressures rise enormously, there is of course a great rise in intracranial pressure and there is

never any local change in the latter which would indicate that this potent drug had locally caused these vessels to constrict.

5. The alterations in systemic pressure induced by the operation of the force of gravity and coming into play when the position of the body is changed, if not perfectly compensated for by constriction of the splanchnic area, will cause corresponding changes in the intracranial tensions. Under the influence of gravity, for example, the intracranial and the intracranial-venous pressures may fall below zero.

It is important to note here that the pressure of the cerebrospinal fluid does not absolutely correspond to the intracranial pressure, partly because this fluid is really a secretion produced by the choroid plexus, and partly because it is readily absorbed either by returning to the venous blood through the Pacchionian corpuscles or by leaking away through the spinal cord and nerve sheaths. As evidence accumulates, the significance of this fluid in a physical sense—that is, as a fluid which may become adapted in amount to accommodate the blood supply—becomes less and less insisted upon, its function being rather that of a nutritive or lubricating fluid.

The comparatively slight amount of extra room which can be provided in the cranial cavity by compression of the venules and capillaries has suggested to some writers that a self-strangulation of blood-flow might occur when the pressure suddenly rises in the basal and cerebral arteries. The increased pressure would be transmitted undiminished through the incompressible brain substance to the thin-walled vessels and compress them because of the lower pressure within. This is the truth but not the whole truth, for if these theorists had carried their reasoning a little further, they would have seen that any curtailment in blood flow through the venules and capillaries could only be transitory, since the compression will be overcome by the arrival of the pressure wave through the blood stream itself. For it is obvious that the arterial pressure transmitted directly must be greater than that pressure after it has overcome the tension of the arterial wall and is transmitted to the venules through the brain substance. Whenever this readjustment has occurred, the cerebral vessels become expanded to the greatest extent possible and they become virtually rigid tubes comparable with the rubber tube suspended in water in a closed flask, as in the scheme referred to at the beginning of the lecture.

These adjustments having been made, the only variation in

intracranial blood supply which can occur is one affecting the velocity of flow or if you prefer the term—the mass movement of the blood; the volume cannot change. After all, however, that is what is necessary to meet the demands for more blood, and the conceptions which have been formed by studies on expansible vascular areas, such as the kidney and spleen, that increased blood supply runs parallel with increased volume, do not apply.

That the mass movement of the blood in the cranium increases when the arterial pressure rises has been shown by direct experiment. Hill and Nabarro found it increased from two to six times during the convulsions produced by absinthe.

Local readjustments of blood supply in different parts of the brain:—Limited though any change in calibre of the cerebral arteries can be, it is nevertheless sufficient to make it possible that local variations in blood supply might occur as a result of active constriction or dilatation of the vessels. Just as the blood supply of a muscle or gland may be varied independently of any change in general blood pressure, by local changes in the calibre of its blood vessels, so might that of the brain be varied, and this might occur to a limited extent for the supply as a whole, as by constriction of the circle of Willis, or to a greater extent in one or other of the arteries which spring from the circle. By the latter adjustment a greater blood supply might be directed into an area which had become especially active, the flow to other relatively quiescent areas being meanwhile somewhat curtailed.

These possibilities raise the question as to whether there are functionally *active vasomotor nerves to the cerebral vessels.* Histologists have definitely demonstrated nerve fibres running on to the cerebral vessels, especially by the use of the *intra vitam* methylene blue method of staining (Huber, Hunter, etc.), but this does not of course necessarily indicate that the fibres normally cause the arterial walls to expand and contract. The only basis upon which such a claim could be put forth is an actual demonstration of changes in intracranial blood flow occurring independently of changes in systemic arterial or venous pressures.

Leonard Hill and Bayliss, and later Leonard Hill and Macleod, have most diligently sought for such evidence, but with entirely negative results. Records were taken of the intracranial pressure, the cerebral venous pressure and the pressure in the circle of Willis (by a cannula inserted in the peripheral end of the internal carotid artery), as well as the arterial and venous pressures in the systemic vessels (carotid and jugular). Since any vasomotor fibres must

presumably be derived from the vasomotor centres, and since these fibres must gain the cerebral vessels through the stellate ganglion and ultimately travel into the cranial cavity along the outer coats of the arteries, the above pressures were simultaneously observed before and during electrical stimulation at these places. It was found that any change that did occur could invariably be attributed to changes in the circulation as a whole; there was never any alteration in pressure locally in the brain for which the occurrence of local constriction or dilatation of the vessels had to be assumed.

Other observers have attempted to investigate the problem by measurement of the volume of blood leaving the brain, but with similarly negative results.

But an objection can be raised to these experiments on the ground that there might be feebly acting vasomotor influences, the effect of which would become entirely masked by the much more potent influence exerted on the blood-flow by changes in the circulation as a whole. As pointed out by Wiggers, the only way by which local changes in the blood flow through the intracranial vessels can be expected to reveal themselves is by measuring the entire outflow, a measurement which, however, it is impossible to make in an intact animal on account of the many pathways through which the venous blood can leave the skull. Measurement of the outflow by one of them does not by any means indicate the magnitude of total outflow. To overcome these difficulties, Wiggers proceeded to measure the outflow from all the cranial vessels of oxygenated Locke's solution perfused into the cerebral arteries under constant pressure. It was found that the otherwise constant rate of outflow became decidedly curtailed when adrenalin was added to the Locke's solution. If we assume that this drug acts only on arterial muscle having functionally active vasoconstrictor nerves, then the result would prove the presence of such fibres to the cerebral vessels, but even granted this, the result does not warrant the conclusion that, under normal conditions in the intact animal, such fibres display any activity. Wiggers does not claim that his results prove that a local vasomotor mechanism is important, but thinks that "they are favourable to the view that cerebral vaso-constrictor nerves are present".

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INTRACRANIAL PRESSURE

By W. F. Hamilton, M.D.

Montreal

INTRACRANIAL pressure has been defined as the pressure which the surface of the brain exerts against the walls of the cranium. The estimation or measurement of the degree of pressure under normal and abnormal conditions has occupied the attention of both physiologists and clinicians. Sir Leonard Hill, Kocher, Harvey, Cushing, and others have laid the foundations of our present knowledge of the subject, and their illuminating teachings have made clear the significance of intracranial pressure and indicated the lines of treatment of this very important condition.

Physiologists have shown that the normal intracranial pressure varies comparatively widely from zero to 50–60 m.m. of mercury, the average pressure under normal conditions being 100 to 130 m.m. of water. It is the same as the venous pressure in the skull, *i.e.*, the same as the pressure within cerebral veins and sinuses, and practically that of the cerebro-spinal fluid; its variations depend upon cardiac systole, the phase of respiration, posture, muscular effort, straining, fatigue, etc. It is of circulatory origin and is intimately related to general venous pressure and less so to arterial pressure. When the intracranial pressure is greatly increased and approaches that of arterial tension, then only is the general blood pressure increased as a result of primary intracranial changes. On the other hand, high general, *i.e.*, systemic arterial tension is not necessarily accompanied by increased intracranial tension.

The statement that intracranial pressure depends upon the circulation or is of circulatory origin is as true when applied to pathological conditions as when a physiological state is under discussion.

The important question for physicians and surgeons to answer is: "When does intracranial pressure become pathological?" On this point Hill's teaching is that "by no *physiological* means can

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Being part of a symposium given at the Medical Week at Hamilton, May 31st, 1918.

intracranial pressure be *maintained* higher than cerebral venous pressure. It is, however, possible that a very sudden and abnormally high rise of arterial pressure should so expand the arteries at the base of the brain as to temporarily compress capillary areas and produce anæmia. Nevertheless, the effect can only be momentary and the circulation once more rights itself and the blood flow becomes increased in velocity."

When the intracranial pressure through any cause, examples of which may be indicated later, becomes (pathologically) greater than the pressure in the venous sinuses, *then the cerebral circulation is disordered.* Then begin venous stasis and cerebral anæmia, which are productive of the signs and symptoms characteristic of increased intracranial pressure.

There is but one vascular system, the circulatory system within the cranium. We may, however, consider this system in relation to intracranial pressure as divided into two systems, the venous and the capillaries system, and the arterial system, each without "functionally active" vasomotor nerves. The ventricles and subarachnoid spaces and their communicating ways may be regarded as forming yet another system of vessels, through which both normally and pathologically fluid circulates.

Thus we may consider three systems within the cranium, each containing fluid—three vascular systems if you will, the cerebral veins and sinuses and capillaries—with venous blood; the capillaries and arteries with arterial blood, and the ventricles with their interventricular ways and foramina and meningeal spaces, through which circulates the cerebro-spinal fluid. The behaviour, or shall we say, the disposition of the fluid in one or another, or at times in all of these systems determines intracranial pressure. Hill's statement that intracranial pressure "is of purely circulatory origin" applies alike in a physiological and in a pathological sense.

The part played by these three fluids or the distribution of them, determines in many instances the degree of intracranial pressure. While Hill maintains that no pathological increase of cerebral tension can be transmitted by the cerebro-spinal fluid, because this fluid can never be retained in meningeal spaces at a tension higher than that of the cerebral veins, yet this view does not appear to take account of the condition which obtains when the intraventricular pressure is raised by blocking of the outlets, by tumour or inflammatory exudate, nor does it regard the effects that seem possible as a result of an abnormally rapid secretion of this fluid. Again it has been stated (on physiological grounds un-

doubtedly) that the amount of cerebro-spinal fluid is far too small to make much difference in intracranial pressure by shifting its position or when it is expressed from the space within the cranium. Here again we would urge that a correct estimate of the normal amount of this secretion is almost impossible, while under various abnormal conditions an enormous amount of cerebro-spinal fluid has been demonstrated as secreted in a day. The brain of a dog, *e.g.*, gave 240 c.c. in twenty-four hours and from certain observations it would appear that under pathological conditions at least, the the cerebro-spinal fluid may play a most important part in bringing about changes in intracranial pressure.

Before entering on the discussion of the symptoms of increased intracranial pressure, it seems well to point out that these vary widely according to whether the pressure has *developed acutely or slowly*. Even though the brain is contained in an unyielding case, yet it shows a surprising degree of adaptation. Should the intracranial pressure become suddenly increased, the signs are pronounced from the beginning. On the other hand, if the change is brought about slowly, a high degree of pressure may be found with but little disturbance, but scant evidence of its existence being discoverable save only by a searching examination. The symptoms in respect of their acuteness and gravity bear comparison very well with those found in the chest when the whole of one lung is suddenly put out of commission by pneumothorax—the lung in a state of collapse, the mediastinum displaced, pain and breathlessness marked, and death not infrequently supervening in such a case within a few hours. On the other hand, in respect of their mildness and apparent lightness, the symptoms bear comparison with those of pleurisy with effusion increasing slowly up to the second rib, the mediastinum displaced, and yet only but slight dyspnœa on exertion. In both cases thus developed, danger is imminent, though not apparent, the margin of safety narrow, the slightest changes may bring about a fatal ending. They bear comparison in one other respect—that a fatal issue may supervene due to circulatory changes—œdema of the brain, œdema of the lungs.

As examples of the acute type, intracranial hæmorrhage, and trauma, may be mentioned, while intracranial tumours, and slowly developing hydrocephalus, afford examples of the chronic type. *The changes following naturally upon an increase of intracranial pressure*, due to the diminution of space from hæmorrhage or new growth or trauma (that pressure which the surface of the brain

makes upon the walls of the cranium or that pressure which any intervening substance, blood, exudate, effusion, tumour—transmits to the brain by reason of its contact within the walls of the cranium limiting, by its bulk, the normal space for the brain) would be the recession of the brain from that point so far as tentorium cerebri and the falciform ligament would admit, and an expression from its various circulatory systems of as much fluid as possible. Generally speaking, the changes are in proportion to the degree of pressure inducing changes in cerebro-spinal fluid, veins, capillaries and finally in arteries themselves; these fluids involving first the ventricular fluid, and compressing to some extent the veins and the venous radicles. The cortex may first give evidence of the pressure, while bulbar signs and symptoms come later, all depending, of course, on the site of the lesion.

The signs and symptoms of increased intracranial pressure vary, not only according to the rate at which the pressure is raised, but also according to the degree of pressure.

First, the displacement of the cerebro-spinal fluid and narrowing of venous channels compensate or make room for the increased tension. Von Schulten points out that compression representing 5 per cent. or 6 per cent. of brain volume in rabbits caused narrowing of arteries, dilatation of veins, and projection of the floor of the fundus oculi. Then, should the pressure increase so that it is greater than the pressure in the cerebral veins, venous stasis is induced. Brain function is disturbed and pain complained of. The signs are referable to the dura, the cortex and the special senses—as shown by headache, restlessness, vertigo, delirium. Slight bulbar signs may supervene, *e.g.*, slowing of pulse, a rise in the general blood pressure, and altered respiration. The veins of the optic papilla may become distended.

A still greater degree of intracranial pressure, which expresses the blood from the capillaries may arise and cerebral anæmia results. The signs of bulbar involvement may now supervene. The respiratory and vasomotor and vagus or medullary centres are involved. The breathing, Nature's protective mechanism to keep the vital centres nourished, becomes irregular; different types have been described (Cheyne Stokes, Biots, etc.). The general arterial blood pressure now increases to a high degree. The pulse is slow, the pupils are now large, now small; the sensorium is now cloudy, now less so, in a word, restlessness and stupor, a state of alternating irritability and non-irritability of centres is clearly demonstarted.

When the intracranial pressure increases, or is long maintained, the centres tire, paralytic signs supervene, or the centers, no longer irritable, fail, and blood pressure falls, coma deepens, the respiration fails and death follows. Such may be course of heightened intracranial pressure.

The outstanding symptoms then developing, as a result of increased intracranial pressure, are explained altogether upon the changes induced in the vessels. As stated in the beginning, "venous stasis" and capillary anæmia, whether induced by a single forceful blow, a displacement of the medulla against the skull, a massive hæmorrhage, meningitis, as a rapidly increasing internal hydrocephalus, may be regarded as explaining all the phenomena of this important and dangerous condition.

The value of eye ground examination in showing increased intracranial pressure.

Increased emphasis is being placed upon the importance of eye ground examination in all cases suspected of increased intracranial pressure. Clinically and experimentally, changes in the fundus are common, ranging from engorgement of veins and slight blurring of the disc to papillo-œdema and choked disc. The condition is now generally ascribed to a mechanical cause. This view is supported by the experimental work. The cerebro-spinal fluid, under tension, finds its way into the optic nerve sheath, exerting pressure upon the vessels of the optic nerve. Bordley, observing the changes in the retinal vessels, while Cushing tapped the ventricles distended on account of meningitis, saw the tortuous veins in the eye become less distended and the arteries become larger as the pressure on the ventricles was relieved. Cushing remarks that observation of the retinal vessels is almost, if not quite, as valuable in observing the cerebral vessel pressure as the glass window in the skull.

Kearney points out that on examining the fundi of 1,400 children with spastic paralysis, which in 70 per cent. of cases, is due to intracranial hæmorrhage at birth, three hundred, or about one in five, showed distinct œdematous changes in the fundi, due to increased intracranial pressure.

In observing many cases in the Royal Victoria Hospital, one concludes that time is a factor in the development of fundus signs, for in nine cases of meningitis, where the intracranial tension as indicated by lumbar puncture was *high*, in only two cases were any changes (and these but slight) noted in the fundus. These patients had been ill from four to eight weeks. In eighteen intra-

cranial tumours of much longer duration (five cerebellar and thirteen elsewhere), the eye grounds were unchanged in three only. Doubtless a mild degree of internal hydrocephalus had developed during the months of illness.

One might add indefinitely to the evidence setting forth the importance of this sign in pressure cases. Enough has been said, however, to make it plain that ophthalmoscopic examinations should be made early and often whenever increased pressure is suspected.

Intracranial fluid or cerebro-spinal fluid. Its relation to intracranial pressure and the significance of lumbar puncture.

It is now generally agreed that the cerebro-spinal fluid is secreted by the choroid plexuses, and augmented by the waste fluid products of nerve cell activity. While the quantity under physiological conditions may be minimal, as pointed out by Hill, yet the amount undoubtedly varies under varied conditions. Secreted by the choroid plexuses the cerebro-spinal fluid is absorbed into the venous system, and, according to a good authority, this process repeats itself every four to six hours, thus demonstrating a fairly rapid movement out of and into the vascular system.

For the topic before us to-day, we are concerned, however, only with the question as to the pressure signs available from lumbar puncture. Some men go so far as to say that lumbar puncture is the most valuable aid we have to-day in the diagnosis of the degree of intracranial pressure.

While admitting the truthfulness of this claim in many cases, we must not forget that the correct estimation of intracranial pressure by this means depends upon the *free communication* of the subarachnoid space in the lumbar region with the cranial ventricles, a condition often absent. Then the character of the fluid may appreciably alter the pressure signs, *e.g.*, a fluid rich in cells, the turbid fluid of cerebro-spinal meningitis. Nor is lumbar puncture free from danger. In long standing intercranial pressure cases, in shock, in tumour of the brain, especially those beneath the tentorium cerebri, the procedure should be cautiously undertaken and carefully carried out. Nausea, vomiting, and headache sometimes follow the operation.

The relation of intracranial pressure to cerebral hæmorrhages, traumatic conditions, hydrocephalus and tumours will be discussed in detail by Dr. Garrow. A few observations, however, regarding intracranial tumours may be made in passing.

While it might appear reasonable that the space which a

tumour takes up in the cranium would determine its influence on intracranial pressure, yet this is not the case. Often the brain substance is destroyed as the new growth progresses, and thus space is not encroached upon. As already pointed out, of far more importance as symptom-producing causes are the changes in the circulation induced by the tumour, anæmia, thrombosis, venous stasis, internal hydrocephalus and cerebral œdema, by which sleeping states, convulsions, paralysis, intracranial pressure signs may be explained.

The cardinal or the typical features of intracranial tumour have long since been enumerated as headache, vomiting and optic neuritis, three prominent characteristic pressure symptoms. It has also been taught that along with these symptoms there is an increase in the arterial blood pressure. Following this matter out over several years, one fails to find evidence in support of this view regarding general arterial pressure. From a considerable number of case reports gone over recently in the Royal Victoria Hospital, in which a diagnosis of cerebral tumour was made, those whose ages varied from a few years to fifty years, no blood pressure was found beyond 130 asystolic phase, while the brain often bulged in operation, and the cerebro-spinal fluid showed a considerable degree of heightened pressure. It may also be stated that on two or three occasions, not included in this series, there was found a subtentorial tumour with the same degree of blood pressure. It is quite different, however, with the fundi. Œdema, optic neuritis, venous engorgement, and optic atrophy, are the terms describing the greater number of fundal conditions found in these cases. In a group of cases of meningitis whose duration—of course—was naturally much shorter than that of tumour, optic nerve involvement was rare, as already pointed out.

Increased intracranial pressure serves to explain more and more the symptoms associated with a large number of diseases, *e.g.*, the acute infectious diseases, and from the evidence constantly increasing, it seems probable that the quantity of cerebro-spinal fluid would explain at least a few of these symptoms. The work of Dixon and Halliburton, in 1913, showed that alterations in cerebro-spinal fluid exerted a marked action on cerebro-venous pressure, and established the fact that increased secretion of the fluid resulted in definite changes in its pressure. They are inclined to believe that a deficiency of oxygen or an excess of carbon dioxide in the blood is the greatest factor in stimulating the secretion of the cerebro-spinal fluid. The good results following upon lumbar

puncture (even decompressive operations in cerebral œdema Cushing, Rawlings), would favour the view that the cerebro-spinal fluid, under pressure, is at all events an important factor in the cause of many of the symptoms—headache, delirium, convulsions, dizziness, etc.

In 1908 Cushing concluded one of his papers by saying that in view of the marked improvement after cerebral decompression in nephritis, this case adds further evidence to support the view that cerebral symptoms of uræmia are largely due to pressure from œdema of the cerebral tissue (*Am. Journ. Med. Science*, 1908). Severe headache and vomiting late in pregnancy, with head retracted and sleeplessness, have been relieved by the withdrawal of sterile cerebro-spinal fluid under great pressure (Gray, *Lancet*, November 4th, 1916).

Delirium, in seven severe cases of pneumonia under treatment by Musser and Hafford, was promptly relieved by lumbar puncture (*Am. Journ. Med.*, October 5th, 1917).

Claude and Meuriot relieved all the signs and symptoms of cerebro-spinal hypertension, following a bruise in the neck, by repeated lumbar punctures. *Le Progrés Medical*, 1916.

Mingazline (Il. *Policlinico*, July, 1917), advocates lumbar puncture in severe paroxysmal headache, with almost uniformally good results.

Rawlings (*B. M. J.*, May, 1918) claims that by lumbar puncture excess of cerebro-spinal fluid is demonstrated in cerebral œdema, seen in case of heat stroke, for which, in several instances, he has done a decompression operation by opening the cranium, with most satisfactory results.

Treatment

A prospective field for therapeutics is opening up as one learns more of the source and the agents which influence the secretion of the cerebro-spinal fluid. Generally speaking, however, it appears that there is but little that can be done by the internist beyond the use of lumbar puncture. Even this has a limited sphere of usefulness up to the present. It seems, however, that this method must become increasingly useful, particularly in cases of meningitis of the serous type, in œdema of the brain, from whatever cause, attention being given, of course, to this condition if an intracranial tumour complicates the case; in toxæmia such as uræmia or alcoholism,

or plumbism, not to speak of those essential headaches, so distressing and so intractable.

It must be admitted by all that the more one studies the subject, the greater is the promise which surgery gives for the relief, both in anticipating and in the actual crisis, of increased intracranial pressure.

Summary

1. Intracranial pressure signs and symptoms depend upon the circulation in the brain.

2. Venous stasis and cerebral anæmia best explain these signs and symptoms.

3. The diagnosis in the less pronounced cases depends upon
   (*a*) general symptoms;
   (*b*) eye ground changes;
   (*c*) lumbar puncture.

4. It would appear in a certain number of instances—a number increasing with the number of observations—that the cerebrospinal fluid, without developing internal hydrocephalus, may account for many symptoms.

5. In the non-inflammatory cases, much relief is afforded by lumbar puncture.

THE SURGICAL RELIEF OF INCREASED INTRACRANIAL PRESSURE

By A. E. Garrow, M.D.

Assistant Professor of Surgery and Clinical Surgery, McGill University, Montreal

INCREASED intracranial tension, whether produced slowly or suddenly—the result of trauma, of new growth, of inflammation or of some congenital deformity, gives rise to circulatory disturbances in the brain. Slight increase of tension causes venous congestion, increasing in severity and extent as the pressure rises. Irritative signs and symptoms may occur when this disturbance affects the non-silent areas of the brain. A still higher degree of intracranial pressure leads to cerebral anæmia, due to compression of the capillaries, with complete loss of function in the area of the brain involved. The blood in the veins is unable to back up into the capillaries or to escape into the sinuses which are narrowed and compressed.

Increased intracranial tension may remain more or less localized, or it may rapidly or slowly become general. Localized pressure is the result of some local compression force, such as a depressed fracture, extradural hæmorrhage, etc. The anatomical arrangement of the falx cerebri and the tentorium cerebelli not only gives support to the contiguous brain surfaces, but they play an important part in localizing increased tension to the lobe or area primarily involved. This protecting influence is especially true of the tentorium, in that it guards the vital centres in the medulla from supratentorial encroachment in the cranial cavity.

General pressure, on the other hand, produced by subdural hæmorrhage, or acute obstructive hydrocephalus, etc., soon gives rise to the major signs of increased intracranial tension, signs that the medullary centres are being interfered with.

The normal intracranial pressure is that of the veins and of the cerebro-spinal fluid. Cushing has demonstrated that the cranial cavity can harbour a foreign body one-tenth to one-eighth the size of the brain without producing the major signs of cerebral compres-

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Being part of a symposium given at the Medical Week at Hamilton, May 23rd, 1918.

sion. This is due to the gradual increase of the body in a part of the cranial cavity which does not interfere with the escape or rapid absorption of cerebro-spinal fluid. On the other hand, a small subtentorial growth obstructing the aqueduct of Sylvius may give rise to a very rapid increase in tension. Sudden compression, on the other hand, such as is produced by deformation of the skull—the result of a severe blow on the head—causes a sudden increase of intracranial tension with capillary anæmia, involving chiefly the supratentorial region. This condition we call concussion. The effect of compression applied so suddenly gives no time for cerebro-spinal fluid to escape or for the venous outlets to become narrow, to compensate for the sudden diminution of the cranial capacity, so the rapidly developed tension applied to the solid and fluid cranial contents affects the capillaries chiefly. This anæmia mainly involves the supratentorial capillaries, but when very severe force has been applied the medullary centres may be equally involved and death from concussion takes place.

Trauma may give rise to temporary compressing effects as in simple concussion, from which the circulation of the brain may sooner or later recover, or it may produce permanent compression (until relieved by surgical treatment) in different ways, viz.: depressed fractures (extradural, subdural), pia-arachnoid hæmorrhages, contusion and laceration of the brain tissue with associated intracerebral hæmorrhage, and later on encephalitis and œdema of the brain. Each of these compressing factors disturb the cerebral circulation and produce venous congestion, capillary anæmia and an accumulation of fluid in the perivascular spaces, and arachnoid tissue—œdema of the brain. This latter condition leads to further venous congestion and still further œdema, so that a vicious cycle is established.

Normally the perivascular spaces drain their fluid into the subarachnoid tissue to mingle with the cerebro-spinal fluid secreted by the choroid plexuses. This fluid escapes from the ventricular sysitem through the foramina of Majendie and Luschka to fill the various cisternæ situated at the base of the brain, and the cerebro subarachnoid tissue, from which it is absorbed largely by the venous sinuses. Anything which interferes with the escape of fluid from the ventricles, or prevents its flow through the cisternæ and subarachnoid tissue and its subsequent absorption and escape from the cranial cavity through the sinuses, increases the intracranial tension.

Retention within the ventricular system from any cause gives rise to obstructive hydrocephalus, the signs and symptoms of which

vary according to the age and condition of the cranial sutures. In the unyielding skull this form may rapidly produce the major symptoms of cerebral compression.

In the communicating variety of hydrocephalus, where there is either an increased secretion of cerebro-spinal fluid or a diminished absorption, due to obliteration of the cisternæ from inflammatory exudate or organizing blood clot, etc., the result on the intracranial tension is similar to that in the obstructive variety.

The experimental studies on cerebral compression, and on the secretion and absorption of cerebro-spinal fluid and the interrelation of these to blood pressure, by Leonard Hill, Horsley, Halliburton, Cushing, Frazier, Mott, Weed, Dandy, Blackfan and many others, have added in recent years much scientific knowledge to what had been taught by the pioneers in this subject.

Their labours have already yielded wonderful practical results in dealing with increased intracranial tension, arising from trauma, new growth, inflammation or congenital deformity.

Phenolsulphonephthalein injections given by lumbar puncture, or by intraventricular injections as taught by Blackfan and Dandy, can differentiate obstructive from communicating types of hydrocephalus, and further, by the examination of the urine, whether in the latter form, the disturbance is due to hypersecretion or to diminished absorption of cerebro-spinal fluid. Their studies have at least shown why callosal puncture, drainage of the ventricle and other methods of treating hydrocephalus have failed to give satisfactory results in the past.

Frazier and Peet have demonstrated that many substances may have some influence in increasing the flow of cerebro-spinal fluid, but that up to the present, one alone seems to have the power of diminishing choroid secretion, viz.: thyroid extract. Ligation of both carotid arteries fails to diminish cerebro-spinal fluid secretion and hence this procedure has no place in the treatment of hydrocephalus.

Headache, vertigo, vomiting, drowsiness and mental lethargy are early signs of increase of intracranial tension. These evidences of venous congestion are very often and quite early reflected on the eye grounds. Ophthalmoscopic examination of the retinæ should form a routine part of the examination in every case of suspected cerebral compression. In local compression, becoming widespread or general, a distince difference in the severity of the venous engorgement and stasis in the retinal vessels in each eye may be made out by the oculist, whose services and advice should always be obtained.

Horsley, years ago, drew attention to the importance of ocular examination in cerebral compression and the urgent necessity of saving vision by a decompression operation, since papillœdema and optic atrophy due solely in these cases to venous and lymph stasis, if unrelieved, result in permanent blindness.

But papillœdema may be absent in tumours, traumatic lesions, and particularly in marked œdema of the brain, so frequently seen after or complicating traumatic lesions, and as recently reported by Rawlings in "heat effects", in which the wet brain was demonstrated by subtemporal decompression and opening the dura, although in some of his cases lumbar puncture failed to reveal excess of fluid or high tension. Rawlings thought this was due to some interference with the normal channels of communication connecting the subarachnoid tissue of the brain and that of the spinal cord.

Every surgeon has noted the uneventful convalescence following compound fractures of the skull, in which free bleeding and oozing of clear fluid have ocurred, particularly the absence of persistent post-traumatic headache, dizziness and mental lethargy, inability to concentrate attention, loss of memory: whereas simple fractures with concussion, and it may be with slight evidences of increased intracranial tension, treated in the usual way by rest, careful dieting and an ice bag, have been followed by annoying and often persistent headache, nausea, vomiting, etc., etc.

Is it possible that operative treatment would benefit such cases? And are these late symptoms due to persistent disturbance in the circulatory system and in the escape of cerebro-spinal fluid? Does œdema of the brain give rise to organic changes in the perivascular spaces and in the avenues of escape of the cerebro-spinal fluid?

The major symptoms of cerebral compression arise when the intracranial tension begins to appraoch that of the blood pressure. These symptoms are a gradually increasing blood pressure, with disturbances in respiration of the Cheyne-Stokes type, and less constantly, though usually present, a slowing of the pulse.

Cushing has shown that these symptoms depend upon capillary anæmia of the medullary centres, the result of which is to stimulate the vasomotor nuclei, causing a rise in blood pressure which overcomes the threatened or actual anæmia in the bulb. If the vasomotor centre, either from exhaustion or protracted anæmia, fails to respond, respiration suddenly stops, but the heart continues to beat for hours if artificial respiration is maintained.

A steadily rising blood pressure, with disturbance of the respiratory centre and slow pulse, demands immediate surgical relief.

In this advanced stage decompression may not always be successful even when blood enters the capillaries, because the vasomotor centre has been exhausted and will not respond to the return flow of blood.

The surgeon must keep these physiological and pathological data in mind when called upon to give relief to increased intracranial tension. As Elsberg says, "I believe that in our operations for cerebral and cerebellar decompression we have given too much thought to the method of the operation and too little attention to the principles upon which such decompression should be based."

Nature has demonstrated for ages how increased tension can be partly relieved in the infant with hydrocephalus. The removal of a large or small portion of the skull and radially cutting the dura imitate this procedure in the unyielding adult skull. Every cerebral tumour is not necessarily associated with marked increase in the intracranial pressure. Its presence is shown chiefly by the local symptoms or by disturbances of cerebral or cerebellar function. On the other hand the early, if not the earliest, sign of a tumour may be those associated with gradually but rapidly increasing general tension due to obstructed outflow from the ventricles. Whatever tension existed in the first case could only be relieved by removal of the growth or by enlarging the brain space. A decompression in the second case, if the tumour is not operable, would not only be useless but positively harmful, whereas a permanent fistula between the ventricles and subarachnoid tissue would or might be followed by temporary or permanent relief.

In many instances decompression is only a palliative procedure to relieve headache, vomiting, and above all, optic neuritis, just as a gastro-jejunostomy relieves the symptoms of pyloric obstruction of cancerous origin.

Elsberg gives the following indications and contra indications for decompressive procedure:

1. In expanding lesions of the brain, where localization is impossible, but the sufferings of the patient are great and the danger of blindness imminent.
2. When the lesion has been localized, but from its nature or location cannot be removed, and is causing marked increase of intracranial pressure.
3. When the symptoms are due to a congenital or obstructive hydrocephalus.
4. Acute intracranial conditions, associated with œdema of the brain.

He does not operate in cases with extensive paralysis or where the patient is already blind, but has few or no other symptoms, nor does he think much benefit accrues in nephritis with œdema of the brain and optic neuritis. He refers to Kocher's recommendation of a decompressive craniotomy over the motor area for epilepsy, but does not think the operation has been of value.

The methods at our disposal to relieve increased tension are:

1. Craniotomy, which may be a so-called decompressive craniotomy, or it may call for the elevation of depressed bone; the removal of extradural or subdural clot or of fluid blood, the removal of intracerebral blood clot as in apoplexy; or even from the ventricle; or for the relief of an œdematous brain.
2. Lumbar puncture.
3. Puncture of the ventricles.
4. Puncture of the corpus callosum.
5. Sellar decompression.

(1) Lumbar puncture may relieve intracranial tension. The normal pressure varies from 60 m.m. to 100 m.m. of water or from 5 m.m. to 7·3 m.m. of Hg. As already stated, Rawlings and others have found a high intracranial with a low spinal pressure.

Repeated aspirations have been employed to relieve hydrocephalus. It should never be used to relieve tension in subtentorial tumours unless a wide opening exists in the occipital bone, on account of the danger of herniation of the cerebellum into the foramen magnum and sudden medullary death (Elsberg).

Willems and Albert (*Int. Abst. Surgery*, Feb., 1918, p. 119) recommend it in concussion and in basal fractures to relieve headache, vertigo and vomiting; and repeated tappings to relieve cerebral hernia.

Frazier and others find its chief value in reducing intracranial pressure after craniotomy, but before opening the dura when tension is high, and also in cerebral operations when the protruding brain renders closure of the dura difficult or impossible.

(2) Ventricular puncture is easily performed in infants through the lateral angle of the anterior fontanelle. Permanent drainage has been more or less successfully carried out by means of silkworm gut, metal tubes and strands of silk, one end of the strand or tube lying in the ventricle and the other in the subdural space. Ventricular puncture is of great value in relieving tension during the progress of an intracranial operation.

Keen chooses a point one and one-quarter inches above and

behind the upper margin of the auditory meatus. At this point a small button of bone is removed and a slit made in the dura. A blunt needle is directed towards a point two and one-half inches above the external meatus of the opposite side The ventricle is usually entered at a depth of two and one-half to three inches in this line.

Elsberg, however, recommends Kocher's method because the depth of the ventricle is greater than the width. The site chosen is that employed in performing puncture of the corpus callosum, and the needle is directed downwards and slightly backwards, and enters the ventricle usually at a depth of from 5 to 6 c.m.

(3) Puncture of the corpus callosum was devised by Anton and von Brahmann in 1908, and was indicated, they believed, in internal hydrocephalus (obstructive), in tumours with associated hydrocephalus, either as a preliminary step to relieve tension before removing an operable growth or for permanent drainage in inoperable tumours.

Choose a point 1 to 2 c.m. behind the coronary suture and the same distance from the mid line. Incise the scalp and remove a small button of bone. Open the dura just outside the lateral margin of the superior longitudinal sinus. A flexible canula with one or two lateral openings and a slightly bulbous end is suitably bent to facilitate its introduction into the superior longitudinal fissure along the side of the falx cerebri. When the canula is arrested by the corpus callosum the stilet, which is used with the canula, is withdrawn and the instrument is forced through the corpus. Successful puncture is evidenced by a flow of clear fluid. Before withdrawing the instrument, the opening in the roof of the ventricle is enlarged antero-posteriorly (not laterally) by bluntly tearing through the fibres of the corpus. On withdrawing the instrument, suture the dura and scalp separately.

The permanence of this fistula depends upon the increased ventricular tension over that in the subarachnoid tissue.

Decompressive Craniotomy

This is employed to relieve pressure in inoperable tumours and in growths which cannot be located. Sufficient bone must be removed to relieve the tension, and in all cases the dura should be radially incised or excised. Callosal puncture, in many of these cases, has obviated the great disfigurement from the resulting hernia, to say nothing of the post-operative paralysis which not infrequently

follow an extensive decompressive operation. As already stated, Frazier has emphasized the importance of recognizing obstructive hydrocephalus as the chief factor in producing tension in many of these cases, and of the value of callosal or ventricular puncture in relieving it.

When decompression is necessary, it should be performed over a silent area and the protruding brain should be protected by muscle and fascia.

Cushing's subtemporal decompression to relieve pressure in the cerebral hemispheres, and suboccipital decompression to relieve tension below the tentorium, are the methods of choice.

Neither time nor the requirements of this contribution allow for a description of the surgical treatment of depressed fractures, epidural, subdural, pia-arachnoid or intracerebral hæmorrhage, although each of these conditions, singly or in combination, accounts for the initial disturbance which gives rise to increased tension. Adequate treatment calls for the elevation of the depressed bone, the arrest of bleeding, the removal of fluid blood or blood clot from the epidural and subdural areas and, if it can be located, from the interior of the brain. Ventricular puncture will reveal blood in the ventricles when present.

Sinoventricular puncture, as devised by Dandy experimentally, so far as I know, has not been subjected to the test of clinical experience.

Haynes, in 1912, advised drainage of the cisterna magna for the surgical treatment of meningitis, and in 1913 proposed and carried out drainage of the cisterna magna into the occipital sinus by means of a small rubber tube, for hydrocephalus.

Payr in 1908 announced a method of draining the lateral ventricle, in obstructive hydrocephalus, into the superior longitudinal sinus by means of a portion of the long saphenous vein.

Each of these three methods depends upon the greater pressure and lower specific gravity of the cerebro-spinal fluid as compared with the blood in the sinuses, so that when an artificial communication is made, there seems to be no tendency for blood to flow from the sinuses either into the ventricle or into the subarachnoid space.

Sellar decompression for the relief of pressure in new growth of the hypophysis is more or less in its developmental stage. Kanavel, Lewis, Mixter, Halsted, Cushing, and Hirsch have devised and perfected the nasal route of approach through the sphenoid.

Frazier and Elsberg have chosen the transfrontal operation. Elsberg thinks sellar decompression should be done by a skilled

rhinologist, who should have no difficulty in opening the sphenoidal cells under local anæsthesia and removing the floor of the sella turcica.

Cystic collections of fluid outside of the brain are rare and are usually found in the posterior cranial fossa. Some of these are undoubtedly collections of fluid in one of the basal cisternæ.

Krause has applied the term "arachnitis adhæsiva circumscripta" as a proper and descriptive name for this condition in the cranial cavity (page 726, Vol. II).

Such collections give rise to compression symptoms and have been mistaken for tumours, indeed most cases recorded have been diagnosed at the operating table.

Incision with or without drainage through the suboccipital route has given satisfactory results.

Early in April a splendid club house for colonial and United States' nurses was opened in Rutland Square, Edinburgh. It is designed as a rest-house for those who are released for a while from their arduous duties in France. The building was originally a club house for men of the overseas forces, and so completely did the house fulfil its mission, that it was soon impossible to accommodate all the applicants. On moving the men's club to new quarters, the Rutland Square house was fitted up by a citizen interested in providing comfortable quarters for visiting nurses. It is expected that the owners of many beautiful Scottish estates will supplement the hospitality of the club house by invitations to their country homes. The Edinburgh branch of the Victoria League is responsible for the club house, and the Marchioness of Linlithgow is president of the branch.

ACUTE ENDO-CARDITIS IN PREGNANCY

By G. Stewart Cameron

Peterboro, Ontario

THE somewhat unusual course of illness and death of a pregnant woman under my care a short time ago prompted me to submit to you a history of the case, together with such literature bearing upon it as I have been able to secure.

Past History. Mrs. A. B., primipara, age thirty-one, farmer's wife, married one year, past history is negative. From a careful questioning of the patient and her friends, I have not been able to find any history of rheumatism, typhoid fever, or any septic trouble which might be accompanied with an involvement of the endo-cardium. As the patient expressed it herself, "she was never ill a day in her life."

Family History. The family history is also negative.

Present Condition. On February 2nd, the patient was taken ill with rather indefinite pains in her back and limbs, together with some slight chills, but as the whole countryside was epidemic with the usual winter influenza, little attention was paid to the condition. About one o'clock on the morning of February 3rd, the patient had a very pronounced chill, and when I saw her a couple of hours later, her temperature was 103° and pulse 120. I saw her the next forenoon when her temperature was down to 100°, and she appeared somewhat recovered from her experience of the night before. We brought her into hospital that afternoon, when a careful physical examination was made, and the following noted:

The patient looked pale and tired. She was moderately well nourished. A marked pyorrhea existed, involving all her teeth. Tonsils appeared normal. Examination of the heart and lungs revealed nothing abnormal. The patient was sixteen weeks pregnant. The urine was normal in quantity and on chemical examination. The bowels had been persistently constipated. The patient's temperature at this time was 98° and pulse 90. If it had not been for the peculiarly anxious mental condition of the patient, we would have been strongly of the opinion that her acute condition had subsided.

Read before the Canadian Medical Association, Montreal, June, 1917.

The following forenoon the patient had a most violent chill, followed by a rise of temperature to 103 2-5 and pulse 130, lasting nearly one hour, together with very marked prostration and breathlessness. The pulse and temperature gradually subsided, and in eight hours reached 98° and pulse 90. During these attacks the patient became delirious, and frequent involuntary passage of both urine and fæces occurred. Examination of the blood at this time showed red cells 3,500,000 and white cells 18,500. Examination of catheterized specimen showed the urine again negative, both chemically and microscopically; examination of the vaginal secretion showed absence of any specific organism. The chills were repeated about every twenty-four to thirty hours, while the temperature and pulse in the interval varied from 96° to 100. Repeated white blood counts varied from 18,500 to 21,000, and repeated urinary examinations showed an absence of pus, albumen, or casts. A blood culture was made, but we do not care to refer to the report as contamination was subsequently advised.

On the fourth day after entering the hospital, a soft blowing murmur developed at the cardiac apex, and by the fifth day the murmurs were heard at the pulmonary and aortic orifices. The blood pressure taken at this time showed a systolic of 120 mm., and diastolic of 90 mm. On the fourth day 50 c.c. of polyvalent serum was given and repeated on the fifth day. Outside of the fact that the white blood count dropped to 9,500, no improvement was noted in the case. The serum was repeated on the eighth and ninth day, but the patient steadily grew worse. No further serum was used. The patient took nourishment pretty freely, but notwithstanding, emaciation was rapid and constant, and the delirium gradually increased. These symptoms continued until February 18th, when the patient suddenly aborted. The act was accompanied with little perceptible disturbance to the patient. Shortly after this she lapsed into unconsciousness, gradually grew weaker, and died three days later, having been ill in all nineteen days.

From the clinical evidence in this case, we made a diagnosis of acute primary endo-carditis, or the so-called malignant endo-carditis. While the disease is somewhat unusual in pregnancy, there was another feature which appeared to us as equally unusual, and that was the possible mode of infection. We think there are three possible sources.

First: As a result of influenza.

Second: From the intestinal tract.

Third: From the pyorrhea.

The patient was undoubtedly exposed to influenza, but as she presented no symptoms prior to the onset of her fatal illness, we think we can reasonably exclude this disease.

Infection through the intestinal tract we know to be a common source, and we think can reasonably be considered here, as the patient gives a history of marked and persistent constipation previous to the onset of this attack.

Outside the specific intestinal infections, such as typhoid, the commonest infection of the alimentary canal is the colon bacillus, but so far as we know it shows an affinity for the genito-urinary rather than the cardio-vascular system, so I think, we can, clinically at least, exclude the intestines as a probable avenue through which infection entered.

To my mind the mouth offers a very apparent and probable portal of entrance for the infecting organism. This being the case, our attention is directed to the association of oral infections with pregnancy. I use the word association advisedly, because it may subsequently be shown that these septic areas are only a coincident of pregnancy, and in no way directly connected with it, but it seems to me that, in the light of our present knowledge, there is sufficient evidence to direct our attention to the mouth of a pregnant woman as a reasonable source of trouble.

It is a well-known fact that caries of the teeth and inflammatory conditions of the gums and mouth are frequent causes of discomfort and even illnesses in the pregnant state. This being the case, it would appear that there might be a greater possibility of infection through the mouth of the pregnant than the non-pregnant.

When we turn to consult the literature bearing on cardiac infection we find that it is extremely limited. So far as the ordinary text-books are concerned, very little attention is given to the subject, and this indicates that the disease is very rare or else it is not considered as a separate pathological condition.

Almost all the articles to which we have had access speak of the lesion as having existed previous to pregnancy, the result of some well marked infection, which became manifest during gestation or the puerperium. It is possible in the case cited we may have had some latent valvular infection which became active in pregnancy, but in the absence of any previous illnesses or symptoms pointing to the endocardium, we think that there is reasonable evidence to believe this infection originated during gestation.

Tuszki[1] speaks of diseases of the heart arising during pregnancy from influenza, typhoid, gonorrhœa, etc., the cardiac lesion in

this case being a direct infection from these specific organisms, and might be from an acute attack occurring either in pregnancy or previously. If it were a previous attack, pregnancy would appear to cause a lighting up of the old lesion.

Durr[2] of the Berlin Charité Hospital is quoted as saying that in 40 per cent. of the cases of endo-carditis seen in pregnancy, no bacteria can be found in the blood and that these are probably gonorrhœal or rheumatic in origin. He also makes the statement that previously healthy women may develop endo-carditis during gestation.

Barclay and Bonney[3] say that the acute form is very rare, but mention it under two separate types, typhoid and septic. The septic type being that usually seen in pregnancy.

In 1909 Ryder[4] gave an analysis of nine thousand confinements at the Sloane Maternity Hospital, in which only ninety-two cardiac cases are recorded. Ninety-one of these showed various forms of endo-cardial and myocardial disease, but there was only one case of acute endo-carditis and this proved fatal.

In 1908 Dr. J. C. Cameron[5] presented a series of cases of endo-carditis occurring in the Montreal Maternity Hospital, but all were chronic in character. He, however, makes the statement that a cardiac lesion may begin in pregnancy as a result of infectious diseases, toxæmias or sepsis.

In a paper on endo-carditis in pregnancy by Vinay[6], he says that acute endo-carditis is very rare during gestation, but is reasonably common in the puerparium in septic cases. He quotes Jaccoud as reporting a case under the name of gestational infectious endo-carditis, but, as this patient was a syphilitic, the cardiac lesions were probably secondary.

Crooms[7] reports a case of malignant endo-carditis during pregnancy, together with autopsy. The clinical history of the case would indicate that there was a pre-existing cardiac trouble, with a secondary infection by staphylococci, which were found in sections of the heart valves. This author gives a history of four reported cases, two of which had history of rheumatism, one with a mitral murmur and the fourth was free from any previous history of heart trouble. Two of these cases died from cerebral embolism within a week of onset of acute trouble. At autopsy one case showed a recent valvular infection while the second had recent vegetations implanted upon an old lesion.

Gerhardi[8] says that endo-carditis occurs with special frequency during pregnancy, and the puerparium, but is inclined to look upon

it as a recurrent lesion frequently manifesting itself during pregnancy and the puerparium, frequently with fatal results.

To sum up our observations, we are led to believe that primary endo-carditis in pregnancy is an extremely rare condition. That in cardiac lesions arising in gestation there is almost always a history of some antecedent infection with cardiac involvement which may become active or reinfected during gestation. That many of these cases are rapidly fatal.

References:

1. Tuszki.—*American Journ. Obs.*, lxvi, 1913, 737.
2. Durr.—*Ibid.*
3. Barclay and Bonney.—"Obs. Emergencies."
4. Ryder.—*Am. Jl. Obs.*, 1909, lix, 17.
5. J. C. Cameron.—*Am. Jl. Obs.*, 1908, lviii, 422.
6. Vinay.—
7. Croom.—*Jl. of Obs. and Gynæcology*, 1908, x, 22.
8. Gerhardi.—"Chap. Puerp. Endocard.", 1914.

The possibility of aerial hospitals for the cure of tuberculosis and other diseases is being discussed by British journals. Advantage is claimed from the facts that the air at high altitudes is absolutely free from germs; and that the atmospheric pressure becomes progressively less as one ascends. The germ-free environment is what the surgeon is constantly seeking at the cost of infinite labour, expense and care, and to the physician it is equally valuable because it withdraws the danger of reinfection from fresh sources. The diminishing pressure of the atmosphere is claimed to be of further assistance in the treatment of tuberculosis; since at ground level the lungs are never thoroughly emptied of air, and the "dead" air left in their cavities is a factor in causing lung disease. Freedom from germs, lowered atmospheric pressure, and the complete sun-bath obtainable may lead to the creation of aerial hospitals, for specially selected early cases of consumption.

THE TRAINING OF THE SURGEON

By Jasper Halpenny, M.A., M.D., F.A.C.S.
Winnipeg

THE available knowledge relating to medicine has now reached such great proportions, no one human mind can encompass it all. Of necessity, specialties have sprung up. Of these specialties, surgery was one of the first to appear, and the range covered is one of the largest as well in the breadth of matter as in the number of patients. And it might be interjected here, that after all the whole science of medicine exists for the patient. In other words, the patient stands pre-eminent.

As to surgery, surgeons are made, not born. The making process we call education. Education should commence when the child begins to use its hands. It should be taught to use both hands equally well, as nearly as possible. As it grows, it should have its reasoning power developed, its ability to observe and record its observations, and its mechanical ability should be encouraged.

Pre-medical training is not yet settled. Should the prospective medical student take a degree in arts? One can scarcely agree that the experience of McGill Medical School is the experience elsewhere. Dr. Adami, speaking on behalf of McGill, and addressing the medical students of Toronto University in 1910, said: "At McGill we have noted as a common occurrence that the frequent B.A.'s amongst our students—of course, there are brilliant exceptions—do but poorly in their first two or three years under us. . . as a rule in their final years these men get into their pace again and do excellently. . . . But all the same, I believe they have wasted roughly a year of their student life."

The experience elsewhere is preponderantly in favour of a degree in arts when possible. And if a degree in arts, what is the best course to take? The popular idea is in favour of the natural sciences. One cannot help but think that a course in philosophy would be preferable, providing as it does a grounding in reasoning.

Read at the Hamilton Medical Week, May, 1918.

The undergraduate course must fill a large place in the training of the surgeon. Furthermore, the training for the coming surgeon, during the undergraduate course, should be identical with that of all other medical students. With all our specialties, we must remember that the patient is a unit. The specialty should be begun only after a broad view of the whole is gained. One cannot agree at all with that renowned English surgeon, Rutherford Morrison, when he said to this Association at St. John, in 1914: "The teaching of those students who are to become practitioners should be different in character and more limited in aim than that intended for developing surgeons." It cannot be decided at the commencement of the undergraduate course, in this country at least, who will and who will not make a surgeon. All should take the same fixed minimum amount of training. Any very brilliant and industrious student might be allowed to do extra work.

If the position just now taken is tenable, the first thing to discuss is the whole undergraduate course and that both in a general way, and also particularly as it applies to the coming surgeon.

There is good precedent for opening up this question of medical training in Canada. Arthur Dean Bevan said to the American Medical Association in 1917: "I believe that the American Medical Association should undertake the task of establishing in some way educational requirements, including a clinical training, sufficiently high to eliminate incompetent surgeons." His words could equally well be applied to the Canadian Medical Association. Possibly the medical schools will show resentment if the surgeons express their opinions on medical education.

Let me quote Alexander McPhedran when he addressed the Alberta Medical Association at Edmonton in 1911: "That the profession through their national authorities have a right to consider the efficiency of the instructors in the institutions sending graduates for license to practice, cannot be gainsaid."

It is probably safe to venture the opinion that there is much need for a careful revision of the undergraduate course in all the medical schools in Canada. With all the additions to the curriculum in recent years there is grave danger of the students being so busy that they have not time to think. And an all important feature in the practice of medicine is *Thinking*. There might with profit be some subtractions as well as additions, and also a readjustment of the proportion of time spent on the various subjects. The time spent on say anatomy and physiology, with their respective kindred subjects, is probably far from right. During two years of the life

of the average medical student, anatomy absorbs about 50 per cent. of his time and 60 per cent. of his energy.

In the senior years there is a tendency to divorce the laboratory work from the wards where lies the object of the whole thing—the patient. This also exists to a certain extent possibly during the junior years. The laboratory is most valuable as an adjunct but it should not be elevated to a place of independence. McPhedran's words are very applicable. "Few of us can do much in the way of laboratory research, but the opportunity comes to all for careful observation on ill people and of accurately recording these observations."

In the undergraduate course, then, after anatomy and physiology, with their kindred subjects histology, pathology and physiological chemistry are taught, the major part of the work ahead is that of learning to make a diagnosis. Next in importance comes obstetrics and then feeding of infants. After these come infectious diseases, dermatology, neurology, and genito-urinary disease. Materia medica and therapeutics are incidental to medicine as are sanitary science and hygiene. The primary years should be built up on the basis of the above. The custom of some men of considering that anatomy and physiology should be taught as self-contained subjects is indefensible. These subjects must be taught as part of a whole.

Granted then that this rough outline of the course is somewhere nearly correct and that diagnosis is not unduly magnified, our problem as surgeons at this stage becomes: how much surgery does the general practitioner or each one of the specialists other than the surgeon need? To make it specific, ask: how much surgery does the ophthalmologist need? Outside of the special features of his own line, he needs a working knowledge of the human body as a whole, in health and in sickness, but he does not need to know how to do a gastro-enterostomy.

A careful perusal of the calendars of the eight schools in Canada, which give a course covering the whole work leading to a degree in medicine, reveals some interesting facts.

In McGill, Dalhousie and Queen's the securing of the degree of doctor of medicine carries with it the degree of master of surgery. If master of surgery means anything, it should mean that the holder of the degree has special qualifications for practising surgery. These schools probably do not mean that this is the case with every student they graduate.

Manitoba gives a C.M. degree, but on a special examination

in surgery alone, on which the candidate must take 75 per cent. to pass. This is better. Would it not be still better to change the whole system completely and give the degree of master of surgery to no one but surgeons? But more of this later.

In Western Canada the village gossip thinks the man from the school which compels every student to accept the degree of master of surgery, is a better man than the graduate from some other schools. They think the man with the degree of master of surgery is necessarily a surgeon, and that the other one is not. In the long run, however, they learn to know better.

The teaching of operative surgery, during the undergraduate course, is a mistake. Every man does not need it. Those that will need it in later life should at this time be getting up diagnosis and all that goes with it. The direct preparation for doing surgery should begin after graduation. It is a grave error to think that operative surgery should not only be taught during the undergraduate course, but that it can be taught on the cadaver. The very high regard a surgeon should have for living tissue is of supreme importance. This can not be learned by working on dead tissue.

In the undergraduate course, all that should be taught of orthopædics should be the diagnosis and an outline of what can be done to improve the abnormal condition. Details of treatment should not be taught at all. In genito-urinary diseases, the diagnosis should be taught, and, in addition, the treatment of acute gonorrhœa, and a knowledge of the treatment of syphilis should be acquired. The student does not need to be instructed in the details of giving neosalvarsan. Neither should he be taught to use the cystoscope, though he should know how to interpret the findings given him by the cystoscopist.

No more should abdominal or extremity surgery be taught at this time. Any student with two eyes and a fair amount of grey matter will be interested enough in and see enough of surgery in any well organized hospital. He will get all that he has time for if he gets up the diseases and their pathology. Many a student knows less about inflammation when he graduates than he does about abdominal operations. He is not to blame. We teachers are.

Not only the subject matter, but methods of teaching are open to question. Regarding the clinical teaching of the final years one agrees with Tinker who says, "there is always the temptation to present the unusual and rare cases, which interest the teacher, to whom the ordinary disease and injury are commonplace." In

the same article he says: "The hours which should be spent in teaching surgical diagnosis, are given over to clinics which are most useful to demonstrate the skill and boldness of their teacher as an operator, than with subjects which would be useful to them in practice."

At this time of specialization the teaching in medical schools drifts more and more into the hands of the highly trained specialists. In time all the teachers will be specialists. Each tends to do the same in his teaching, as is so common in practice, viz.: to magnify his particular department often to the extent of ignoring the unity of the patient. If medicine is to preserve a well balanced proportion, with due regard to the oneness of the patient, the teaching must either be in the hands of specialists who do not forget the above mentioned unity of the patient, or it must drift back into the hands of the general practitioner. The latter is not desirable.

In this it will be observed by some that there is no suggested place for surgery whatever. Well, what is surgery? If it is only doing operations, then there is surely no room for surgery up to this stage. If surgery includes making the diagnosis, then it is included. And who will say that the major part of surgery is the mechanics, and that the minor part is the making of the diagnosis? Surely the diagnosis here, as in internal medicine, is the beginning point.

After finishing the academic term, no student should be given a license, and possibly not a degree, until he or she had served at least one and better two years residence in an approved hospital. All students, irrespective of whatever specialty they may intend to follow, should have this general training in a hospital. (For men who have got thus far at a fairly early age, say twenty-three or twenty-four, two or three years spent in general practice would be of great value to the surgeon-to-be.)

At this stage the man who wishes to be a surgeon should begin to get the special training necessary to equip him, but not before. He should now spend at least two years more, and better, three, as resident surgeon in some well organized teaching hospital, or associate himself with some surgeon of wide experience and good judgement for an equal length of time. Many young men would most gladly spend this amount of time in a hospital if a fair stipend were offered. Safe it is to say that for the second year's residence in hospital, the intern would be content with even the pay of the operating room orderly. The young man who is willing to spend all these years in training for highly specialized service for the

public, is surely entitled to some financial remuneration during the last years of his training, which years, be it remembered, are full of service to the people.

As the potential surgeon grows in judgement, caution and knowledge, he should have increased responsibility placed on him even to the extent of doing much work himself, first under the eye of his chief and later, alone. The man must be given a load to carry all by himself in order to make him realize what responsibility a surgeon assumes when in practice on his own account. Any house-man worth the name will not abuse the confidence reposed in him by his chief.

Halsted says: "The faults of our system of educating surgeons begin almost at the bottom and continue to the top. I am considering only the training of the best men, those who aspire to the higher career in surgery. On graduation they become hospital interns, but their term is only one and a half, occasionally two years, not as long, on the average, as that required of each medical graduate of the University of Tokio. . . . It is a grave mistake, it is a shame, to check suddenly the advance of these superior young men, who are tense with enthusiasm, who rejoice in the work to which they hope to be able to dedicate their lives. It is from these men, we must not forget, we are to draw our teachers of surgery." Three years spent thus will be vastly more valuable to him than a post-graduate college course with a degree at the end of it.

During the term of internship, provision should be made whereby work on anæsthetized animals may be done. It is highly desirable that this work be carefully supervised, else it may develop into careless habits, because of the knowledge that the dog is to be sacrificed soon, possibly at the end of the operation. If properly supervised, this is an adjunct that cannot be too highly regarded.

After training is completed and the man gets out into practice, how is he going to get the necessary cases? Montreal has closed hospitals. Is there any opportunity for the young surgeon to prove that he can "make good". Surely the custom in Montreal is too conservative. There is in that policy very little that offers an open door to the hard working, well trained young surgeon. Winnipeg has the "open door" policy, whereby any man can operate on a private patient when he can find one. This policy gives opportunity to the young surgeon. It is at the same time open to grave abuse. Stewart rightly observes: "Recent medical graduates rush in and do major surgery, their first attempt at abdominal operation being saved from fatal results by the grace of God and

access to a clean operating room." The open door must be carefully guarded by a board of management guided by a superintendent with a conscience, so that surgeons, but none other, are allowed to operate.

When once a surgeon has got the necessary training and the necessary cases, his future as a true surgeon depends on how he reads, how he thinks, and how he records. Reading is the easiest task. Journals and books are only too numerous. The busy surgeon sometimes forgets to think and ponder. Visits to other clinics are most essential. A good system of recording and following up cases is equally essential. With regard to the latter feature it is probably the weakest point in the life of the average surgeon.

In conclusion it is respectfully suggested:

1. That there should be an agreement among all the medical schools in Canada on the general principles regarding the teachings of surgery.

2. That the C.M. degree, as it is now stands, should be abolished.

3. That a new degree be established, with the same or a similar name, to be based largely on work actually done, rather than on a formal examination only.

4. That for the present this degree be granted not sooner than four years after graduation, and that, by mutual agreement amongst the universities of Canada, this time be extended later on to five years.

5. That all hospitals to which any public money is contributed either for construction or maintenance should open the private wards to any man holding the above mentioned degree and who is known to the board of management to be a man of unquestioned reliability.

And finally:

6. That this surgical section of the Canadian Medical Association take the initiative in the matter of setting requirements for surgeons. This could possibly be best done by working in conjunction with the American College of Surgeons, to which a goodly number of the Canadians belong.

BOTULISM

By Ernest C. Dickson, M.D., *Captain, C.A.M.C.*

MY object in appearing before you is to draw your attention to a type of food-poisoning caused by the ingestion of home-canned products which has assumed considerable importance on the Pacific Coast of the United States during the past few years, and which is occurring with increasing frequency in other portions of that country. I am unaware of any established cases in Canada, although there is little doubt that some will appear, but recent reports have shown that botulism has occurred with some frequency in England, and it therefore behooves us to become acquainted with the condition and to recognize the causes for its occurrence and the means by which it can be prevented.

Botulism or Allantiasis, the old *Wurstvergiftung* of Southern Germany, has been recognized as a serious type of food-poisoning since the early part of the nineteenth century, but it has been thought to be exclusively a type of meat poisoning, since the greater number of cases, as the name implies, was caused by the ingestion of sausages. So firmly has the idea that it is exclusively a meat poisoning been established, that when, in 1904, an outbreak of poisoning from bean salad occurred in Darmstadt in Germany, Landmann, who investigated the outbreak and who proved that it was indeed botulism, made the statement that there must have been some pork cooked with the beans since it is impossible for the toxin of B. botulinus to be formed in other than meat-containing medium.

Our accurate knowledge of the fact that botulism may be caused by the ingestion of foods of vegetable origin dates from December, 1913, when there was an outbreak of food-poisoning of the botulinus type at a Sorority house at Stanford University, in which twelve persons were poisoned by eating a salad prepared from home-canned string beans. We were unable to prove from this outbreak that the intoxication was indeed botulism as we were

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From the laboratory of experimental medicine, Stanford University Medical School, San Francisco, California.

unable to demonstrate B. botulinus from any of the materials which were available for bacteriologic examination, but, stimulated by this outbreak, we obtained cultures of B. botulinus from the Museum of Natural History, and from the Department of Bacteriology of Columbia University in New York, and commenced a series of experiments which have been continued until a few weeks ago. As a result of our experiments we have established beyond all doubt that the toxin B. botulinus may be formed in mediums prepared from peas, beans, corn, asparagus, artichokes, peaches, pears, apricots and prunes, and since the outbreak which occurred at Stanford University, we have been able to collect records of a fairly large series of outbreaks in which it was established that the poisoning was caused by the ingestion of one or other of these vegetables or fruits. All of them home-canned.

The symptomatology of botulism differs from that of the usual types of food-poisoning in that the intoxication is essentially one which involves the central nervous system. The condition is not an infection, but is a true intoxication, the poisoning being produced by a bacterial toxin, somewhat analagous to the toxins of diphtheria and tetanus, which is formed in the food before it is eaten and which is ingested with the infected food. The toxin is never formed within the body, as the optimum temperature of B. botulinus is from 24 to 28 degrees Cent. and the toxin will not form at a temperature of 37·5 degrees Cent., the normal temperature of the body. It differs from the toxins of diphtheria and tetanus in that it is not digested in the gastro-intestinal tract, but is absorbed unchanged into the blood stream.

The symptoms usually appear in from eighteen to thirty hours after the ingestion of the poisonous food, although they may appear in from four to eight hours. The earliest symptom is usually a sensation of languor and fatigue, but this is soon followed by characteristic disturbances of vision, blurring of vision, diploplia, and loss of accommodation. There is often early vertigo and incoordination of muscular movement. Dryness of the mouth and pharynx, a sensation of enlargement of the tongue and a peculiar sensation of constriction of the throat soon follow. There is marked inhibition on the serous salivary secretion, and the mucus portion is secreted in a thick, tenacious form which is removed from the pharynx with great difficulty. Speech soon becomes impaired and unintelligible, and there is difficulty and eventually inability to swallow. The patients suffer greatly from strangling spells induced by their attempts to swallow or to raise the thick mucus from

the pharynx. There is rarely any acute gastro-intestinal disturbance, although there may be initial nausea, vomiting, and diarrhœa. A characteristic feature of the intoxication is that there is obstinate constipation which may be so severe as to resist all efforts to induce evacuation of the bowels.

There is early blepharoptosis and mydriasis with loss of pupillary reaction to light, and occasionally there is paralysis of all the extrinsic muscles of the eye so that the eye-ball remains fixed in the socket. Occasionally there is paralysis of the muscles supplied by the motor portion of the fifth and by the seventh cranial nerves, but this is more uncommon. There is loss of the pharyngeal reflex in the majority of cases. There is marked general muscular weakness, but there is no true paralysis of the skeletal muscles and the skeletal reflexes are not lost. True paralysis is apparently confined to the muscles which are supplied by the cranial motor nerves.

A striking feature of the botulinus intoxication is that there is no disturbance of mentality and that sensation remains intact. There may be some inhibition of the sense of taste, but this is probably chiefly if not entirely due to the absence of the serous salivary secretion. There is rarely any disturbance of hearing. The disturbances of vision are entirely dependent upon the loss of function of the intrinsic muscles of the eyes, as the retina rarely shows any change. There may be initial headache and nausea, but there is otherwise rarely any pain.

The temperature is usually sub-normal; in fact, when fever occurs, one should be strongly suspicious of the onset of some intercurrent infection such as broncho-pneumonia. The pulse rate may be slower than normal at first, but it soon becomes rapid and the combination of a temperature of between 96 and 97 degrees Fahr. with a pulse rate of over 130 is very striking.

The intoxication usually reaches its maximum severity in from four to eight days, and then, if the patient survives, gradually subsides. Convalescence is very slow and tedious. In fatal cases, death usually occurs in from four to eight days, and it is seldom that persons who survive for ten days succumb unless some complication such as aspiration pneumonia ensues. Death usually occurs from cardiac or respiratory failure.

The mortality in the European cases, occurring during a period of over one hundred years, is about 40 per cent., but in the United States, probably because only the severe cases are recorded, the mortality has been between 65 and 70 per cent. When patients recover there is rarely any persisting disability.

Treatment is most unsatisfactory. It is important to wash out the stomach even though the poisonous food has been eaten several days before, as there is early inhibition of stomach motility, and cases are recorded where portions of the poisonous meal have been found in the stomach at autopsy several days after it was ingested. Purgation should be induced if possible, preferably with magnesium sulphate or some similar saline and the lower bowel should be frequently washed by enemata. Simple, nourishing food should be given in sufficient quantities and a generous supply of water should be administered, but it should be remembered that on account of the loss of pharyngeal reflex and the frequent strangling spells when the patient attempts to swallow, there is constant danger of insufflation pneumonia. It is therefore advisable to administer food and laxatives by stomach tube and to give water by hypodermoclysis or by rectum. The Murphy drip has been found to be very satisfactory.

Stimulation should be given as required; strychnine probably being of value. Digitalin has been used extensively to combat cardiac failure, and pilocarpin may be used to relieve the dryness of the mouth and pharynx, although pilocarpin should be given with caution, since the patient is unable to cough up fluid from the lungs if pulmonary edema is induced.

Antitoxic serum may be produced but experiment has shown that it is of little therapeutic value unless it can be given very early. It affords full protection to guinea pigs when mixed in vitro and injected with the toxin, but when given more than twelve hours after the administration of a M.L.D. of toxin, there is little protection. I have used antitoxic serum in two human cases of botulism and both recovered, but I am not at all certain that the serum in any way influenced the course of the intoxication, as it was several days after the ingestion of the poisonous food that the serum was given.

The pathology of botulism is extremely interesting in that there is a peculiar, characteristic type of thrombus formation in the blood vessels of practically all organs, the thrombus being studded with leukocytes. The symptoms are not explained by the presence of the thrombi, however, as the thrombi are rarely found in animals which have died within forty-eight hours after the administration of the toxin. There is also marked hyperæmia of practically all organs and usually there are many hæmorrhages in the meninges and in the lungs and serous surfaces. Our experiments and our histologic examination of tissues from human victims

do not support the theory that there is a so-called specific action on the finer structure of the nerve ganglion cells.

The importance of this type of food-poisoning at the present time lies in the fact that by far the greater number of cases which have occurred in the United States have been caused by the ingestion of home-canned vegetables and fruits. The reason for the prevalence of the botulinus toxin in home-canned vegetables and fruits is that many of the methods of sterilization which are employed in home-canning are not sufficiently potent to kill spores of B. botulinus when mixed with albuminous material in containers such as are used. The common practise is to immerse the filled jar of vegetable or fruit into boiling water in a wash-boiler for from two to three hours and this is not sufficient. We have found in test tube experiments with emulsions of spores of B. botulinus in brain and in vegetable mediums that the spores will resist immersion into actively boiling water for more than two hours, and will resist immersion into water at 95 degrees Cent. for more than three hours. Eight strains of B. botulinus were tested in this way, and the results were constant in seven. When one considers the time necessary for the penetration of heat into the centre of a closely packed jar of vegetable, it is readily understood that the sterilization in the centres of the jars may be incomplete.

The addition of lemon juice or vinegar to vegetables as recommended by Cruess of the University of California, greatly reduces the resistance of the spores to heat, but lemon juice must be added in amounts of at least 4 per cent. to be of value. I have record of one outbreak of botulism which was caused by the ingestion of string beans to which "a small amount" of lemon juice had been added, but evidently the amount of lemon juice was insufficient. Our experiments have shown that the mere presence of 4 per cent. lemon juice or of 65 per cent. cane sugar in bouillon is not sufficient to prevent the growth of B. botulinus, and the formation of its toxin, although they do inhibit the toxin formation to a certain extent. It is therefore apparent that one must not depend upon lemon juice or sugar to preserve the fruits or vegetables unless the sterilization has been complete.

A very few outbreaks of botulism caused by commercially canned vegetables have been recorded, but they are very rare. The rarity depends, I believe, upon the fact that in the United States the vegetables are sterilized with steam under pressure at a temperature of from 240 to 250 degrees Cent. The freedom from contamination of commercially canned fruits which are canned at

lower temperatures is probably dependent upon the fact that only carefully selected, hand-picked fruit is canned. In the only instance of poisoning from home-canned fruit in which we were able to get all the data, it was found that the fruit had been unsalable, wind-fall fruit, and it is probable that the fruit had become contaminated with B. botulinus while lying on the ground.

It must not be understood that I am advocating any decrease in the amount of home-canning of perishable foods, but I am convinced that as professional men who are interested in the preservation of the health of the community, we should take steps to have the public understand that the use of home-canned food is not unattended with danger, and that, with proper care, all danger of poisoning may be averted. Very often the home-canned food which is contaminated with toxin of B. botulinus is so evidently spoiled that it is discarded at once and no accident occurs unless it is fed to domestic animals or fowl. There are, however, many instances when spoiled home-canned food has been fed to domestic animals and fowl, and they have developed symptoms which are analogous to those produced by botulinus intoxication in human beings, limber-neck in chickens and turkeys, forage poisoning in horses and mules and "paralysis" in hogs. At other times the food is not so evidently spoiled and poisoning may be caused by the housewife tasting it to determine whether it is good. I have records of six outbreaks of botulism which were caused in this way, and five of the six victims died. Usually there is a peculiar cheese-like odour in food which is contaminated with toxin of B. botulinus, and it is this odour which attracts the housewife's attention and causes her to taste the food. Often, however, this odour is so faint that it does not attract attention, unless one is familiar with it and is looking for it.

All of the cases of poisoning by home-canned products have occurred when the food has not been cooked before it was eaten. Is it a common thing to serve home-canned vegetables without cooking as salad, and in such cases there is especial danger, as the toxin has a peculiar sharp taste which is quite palatable in salad. At other times the poisoning has occurred after the ingestion of fruits which are "a little turned" and which are not displeasing to the taste. It has been definitely established that the toxin is destroyed if it is heated to the boiling point and that contaminated food is entirely safe in so far as botulinus intoxication is concerned if it is cooked before it is eaten. There are numbers of instances in which portions of contaminated food have been cooked and eaten

without ill effect whereas the remaining portion has been eaten as salad and has caused fatal poisoning.

The important facts that should be emphasized in connection with botulinus intoxication from home-canned foods are the following:

1. That only the best available methods of home-canning should be recommended.

2. That the housewife should not be discouraged from canning perishable foods but that she should be instructed as to the possible danger of poisoning in using home-canned food and as to the methods of preventing its occurrence.

3. That under no circumstances should home-canned food which shows any sign of spoilage be used as food or even tasted.

4. That the slightest indication of an unusual odour should be regarded as sufficient reason for discarding home-canned food.

5. That all home-canned food should be boiled before it is eaten or even tasted.

If these precautions are taken, there will be no danger of the occurrence of food-poisoning of this type from home-canned products.

FOOT-NOTE.—For a more complete discussion of symptomatology and pathology, see "Botulism, a Clinical and Experimental Study." By E. C. DICKSON. Monograph No. 8 of The Rockefeller Institute for Medical Research.

THE AFTER-EFFECTS OF WOUNDS OF THE CHEST AND THEIR TREATMENT

By John Meakins, *Lieutenant-Colonel, C.A.M.C.*

AND

T. W. Walker, *Captain, C.A.M.C.*

(From the Medical Division, 15th Canadian General Hospital, Taplow, Bucks.)

THE eventual degree of disability of soldiers suffering from wounds is of great importance, not only from the military, but equally from the civilian point of view. In all classes of injury the object to be striven for is such reduction of the disability as will make the patient again fit to be a soldier. Where this is not feasible, it is the aim of the physician to reduce the disability as much as possible in order that the patient may resume his civil life with no greater handicap than can be avoided. The seriousness of certain classes of injury is directly proportioned to the extent it reduces the capacity to do physical work, independently of the amount of damage that may have been done. In this category are included those cases which have received penetrating wounds of the chest. The severity of the original injury need not be, in fact is not, in these cases an index as to the eventual usefulness of the individual. Some cases are disabled out of all proportion to the apparent seriousness of the wound, while others with greater local disturbance make remarkable progress and eventually exhibit little or no diminution in power of physical exertion. The present work was undertaken with the twofold object of investigating the after-effects of injury to the chest and of determining the best means of reducing the disability to a minimum.

The observations to be reported are based on seventy such cases admitted to this hospital during the latter six months of 1917. The majority were received direct from France, where they had been under treatment for an average period of four weeks (from three days to fourteen weeks). The cases varied considerably in character. Eleven (15·7 per cent.) had been operated upon for the evacuation of pus in the pleura, while in nine cases (12·8 per cent.) the foreign body had been removed. With regard to these latter,

it should be noted that in all except one case the foreign body was merely removed from under the skin. In the exceptional case it had been removed from the left lung close to the pericardium at the time of operation for empyema. In 60 per cent. of the cases there was a history of hæmoptysis, it being of a severe character in one case only. In 66 per cent. there was a history of fluid in the pleural cavity.

On admission to this hospital, careful notes were taken as to the condition of the chest. In 28·6 per cent. of the cases no abnormal physical signs could be detected, although in all of these there was clear evidence of penetration. In the remainder the examination revealed conditions as set forth in Table I.

TABLE I.

Collapsed lung	2·9 per cent.
Thickened pleura	38·6 "
Fluid	12·8 "
Fluid and thickened pleura	12·8 "
Air	4·3 "

In all those cases which had been operated upon in France for empyema, a discharging sinus still existed, and in only one of these was a secondary operation necessary. In this case the injury had involved the abdomen, and a subphrenic abscess had developed in the left side, which was drained through a small hole in the pleura. Eventually this opening had to be enlarged to permit of better drainage. Empyema developed after admission to this hospital in three cases, in all of whom fluid in the chest had been reported from France. In one case only was it found necessary to remove the foreign body from the lung. In all of the cases, except two, the physical signs were quite typical of the condition which was supposed to be present. In both of the cases which presented atypical signs there was increased vocal resonance and tactile fremitus over the abnormal area. All the other physical signs were those which are considered the classical signs of pneumothorax. It was difficult to account for these abnormal findings. In both of these cases there was only a partial collapse of the lung. In the series there was one other case of pneumothorax. There was complete collapse of the lung in that case. At first there was absence of tactile fremitus and vocal resonance. Later there developed s ight expansion of the lung and a distinct increase of both of these signs over the normal side.

The progress of the physical signs was carefully noted in relation to the improvement or otherwise of the patient's condition,

and in regard to his ability to accomplish physical work. But it soon became apparent that little or no information of value as to this point could be obtained by percussion or auscultation. The most significant finding was the development in a varying degree of a distinct physical deformity, which progressed without any change in the physical signs except those revealed by inspection. This deformity was manifested in various ways. It varied from a simple muscular atrophy with or without pronounced drooping of the shoulder girdle, to conspicuous contraction of the chest wall, with curvature of the spine.

In order to obtain reliable and comparative records of the progress of this deformity, it was necessary to adopt more accurate methods than those of ordinary inspection. It was found impossible by observation alone to detect any change of less than one-half inch in the relative levels of the shoulders, and this was particularly difficult in estimating the improvement or otherwise in the condition. Therefore a height gauge was devised. This consisted of an upright or standard with two sliding arms. The patient was placed in front of this and the standard was aligned with the axis of the spine. The arms were then adjusted in such a manner that the wedge-shaped pointers rested exactly on the acromio-clavicular articulation of each side. On the back of the standard a scale in inches indicated directly the difference in level between the two shoulders.

It was also difficult to determine the shape and relative size of the two sides of the chest, and any changes which might subsequently occur. Therefore a cyrtometer was employed, and the outline of the chest transferred to a large piece of paper. These outlines were then reduced to half size by means of a pantograph, and filed with the case sheets.

The deformity frequently appeared very early. The earliest was recorded two weeks after the date of injury. The first manifestation is a muscular atrophy about the points of injury. This may progress in a varying degree, so as to involve all the muscles of the chest wall and the shoulder girdle. It may even extend to the deltoid and muscles of the upper arm of the injured side. As a consequence of this atrophy, an early droop of the shoulder becomes apparent. The further deformity follows upon a falling-together of the ribs, which may be finally accompanied by curvature of the spine. At any stage the progress of the deformity may cease.

The determination of the cause of this deformity was recognized as of first importance. In view of the fact that the missile

traversed, in all cases, the chest wall, the pleura, and the lung, it seemed probable that the deformity was the result of the injury to one of these.

In so far as could be determined, direct injury to the muscle produced in itself only slight atrophy, which was confined to the single muscle injured. In cases where the ribs were fractured, without signs of the involvement of either the pleura or the lung, any deformity which occurred was strictly dependent upon the local condition. If there had been loss of portions of the ribs, or if the fracture was not in proper alignment, a local deformity of greater or less extent naturally occurred; but if there was no loss of rib substance and the fracture was in good position, no deformity ensued. Furthermore, an analysis of the site of the wound showed that it was immaterial whether the injury was above or below the third rib, as there was practically an equal prevalence of deformity in either case. In no case did any general deformity result unattended by signs of disturbance of lung or pleura.

With regard to injury of the lung tissue, it was found that the presence or absence of a history of hæmoptysis gave no indication as to the future presence and degree of deformity. Likewise in those cases in which the foreign body was retained in the lung substance, this did not appear to have any influence on its development. In so far as local collapse of the lung was concerned, in no case did this occur without a history of the co-existence of either fluid or air in the pleura. In fact, there was no evidence that injury to the lung tissue *per se* had any influence on the development of the deformity.

On examining into the degree of disturbance of the pleural cavity, it was found that in 94 per cent. of the sixteen cases where the pleura was free from all evidence of disease, little or no deformity occurred. In one case the patient suffered from an infected bomb-wound just below the middle third of the right clavicle, which had necessitated an extensive incision through the pectoral muscles. This had healed by secondary intention, and the ensuing contraction of the scar had produced considerable deformity of the right shoulder. The general deformity in this case is accounted for by a strictly localized condition.

TABLE II

Deformity	Pleura free Per cent.	Hæmothorax Per cent.	Pyothorax Per cent.	Pneumothorax Per cent.
Nil	57	39·5	7	0
Slight	37	39·5	40	50
Moderate	6	6	26·5	16·6
Conspicuous	0	15	26·5	33·3

It will be seen in Table II that there was a progressive diminution in the number of cases exhibiting no deformity, and increase in those which did, depending upon the manner in which the pleural cavity was involved.

The cases of hæmothorax presented two well defined classes, determined by the absence or presence of fluid in the pleura when they came under our observation. The former class comprised twenty-five patients. All of these gave a history of hæmothorax, but in none of them were there signs of fluid after an average period of three weeks from the date of injury. Among these no instance of marked deformity developed. It was at first thought probably that these cases might have suffered from only a small hæmothorax, and this might have accounted for the fact that no deformity developed. But in fourteen of the cases aspiration had been performed one or more times, although only in six of these was the amount recorded. It averaged about 800 c.c. (240 c.c. to 1,800 c.c.). One of these cases was wounded on August 12th, 1917, in the left intercostal space in the axillary line. On the 15th 500 c.c. of blood were aspirated. Another 500 c.c. were removed on the 18th, and on the 21st 800 c.c. more of bloody fluid were aspirated. On admission to this hospital on the 29th, the physical signs were practically normal. No deformity developed in this case, except slight atrophy of the thoracic muscles of the back. Therefore this could hardly account for the absence of deformity. The latter class comprises eight cases, in each of which fluid was present when the patient was admitted to this hospital. In one of these the injury had occurred a week before. Shortly after admission 500 c.c. of bloody fluid were aspirated and the signs of fluid soon disappeared. This case did not develop any deformity.

In the other seven cases there were signs of a varying amount of fluid in the pleura, after several months had elapsed, since the time of injury. In three of them aspiration had been done some time before. In all seven cases pronounced deformity existed when admitted, and this showed a tendency to increase. It seems, therefore, that the persistent presence of fluid in the pleural cavity plays a conspicuous part in the eventual development of deformity of the chest.

Empyema developed in fifteen of the cases. Of these, seven (47 per cent.) were operated upon within fifteen days of the time of injury, and in none of them did any general deformity follow. In eight cases (53 per cent.) however, the operation was not performed until an average period of six weeks had elapsed. In all of these cases a conspicuous deformity did develop.

There appears, therefore, to be a close connection between the development of the deformity of the chest and the length of time that the pleura is allowed to retain a quantity of fluid, irrespective of whether it be sterile or infected.

Only six of the cases gave a history of pneumothorax. Two of these evidently had a hæmopneumothorax while in France. They were both repeatedly aspirated, and when admitted to this hospital, seventeen and twenty days later, there were no signs of either air or fluid in the pleura, and only slight evidence of thickened pleura. Another case was reported to have had an extensive pneumothorax in France, which necessitated aspiration for relief of the symptoms. When admitted to this hospital, five weeks later, there was a small localized pneumothorax about the site of the wound of entrance. This was situated anteriorly over the inner end of the second rib. There was loss of substance of this rib, and a hernia of the lung about three inches in diameter, which eventually disappeared by the use of a firm pad. In none of these three cases did any deformity of an appreciable degree develop.

One of the other three cases gave no history of a pneumothorax, but on admission to this hospital there were signs of a moderate hæmothorax with an extensive pneumothorax which caused urgent symptoms. Aspiration was performed which gave relief. This was done two and a half weeks after time of injury. The recovery of this case was very tedious but progressive. A moderate deformity developed, which under suitable treatment had practically disappeared at the time of discharge.

The two remaining cases, on entrance to this hospital, were quite normal except for the small entrance wounds, which were healed. One of these cases developed acute dyspnœa with collapse on the first occasion of being out of bed, five weeks after the injury. On examination there were signs of pneumothorax. The symptoms were paroxysmal, occurring in the evening and lasting a few hours. There was no increase at these times in the signs, which showed involvement of the whole right thorax, with complete collapse of the right lung. On the third day aspiration was performed, which relieved the urgent symptoms of dyspnœa and orthopnœa, but made no impression on the physical signs. Repeated aspiration did not effect any reduction of the pneumothorax. The recovery in this case was extremely slow, and the consequent deformity most conspicuous.

The other case gave a history of a right pneumothorax with complete collapse of the lung. There were no signs of pleural

involvement on admission to this hospital. He developed an acute recurrence of the pneumothorax six weeks after the injury on being out of bed for the first time. The symptoms were not as severe, nor did the signs, which were confined to the upper half of the chest, indicate such an extensive degree of collapse of the lung as the former case. The most outstanding feature was the asthneia and neurotic symptoms, both of which retarded recovery. On being allowed out of bed again, there was evidence of considerable deformity of the right chest. On suitable treatment, however, there was great improvement, until on discharge it was almost impossible to detect by examination which side of the chest was injured.

In view of the above facts it appears permissible to account for the varying degrees of deformity which may develop in cases suffering from penetrating gunshot wounds of the chest as follows: Those cases in whom there is a simple perforation of the chest, without appreciable and persistent involvement of the pleural cavity, as a rule show some local atrophy of the muscles. The muscles are temporarily splinted, particularly if there is pain caused by respiration, and if a cough is present this splinting is accentuated. Furthermore, if the pectoral muscles or the latissimus dorsi be perforated, and movement of the arm is also considerably restricted, the local atrophy becomes more conspicuous. Thus there may be moderate drooping of the shoulder of the affected side, which frequently develops very early, the result of atrophy of the muscles of the shoulder girdle, apparently due to disuse. But the general conformation of the chest wall is not as a rule altered. A pronounced change in the shape of the chest wall appears only to develop when the pleural cavity is allowed to remain for a considerable period in an abnormal state. In addition to the immobility of the affected side of the chest, which is usually extreme in such cases, there is another factor to be taken into account—namely, the change of the intra-thoracic conditions. When a part of the pleural cavity is occupied by blood (of varying concentration) for some time, organization eventually occurs. This organized material is adherent to both layers of the pleura, and as contraction proceeds, compression of the lung and diminution of the volume of the intra-thoracic contents occurs. This is indicated first by elevation of the dome of the diaphragm. When this has reached a certain point, other factors prohibit its further extension, and in consequence the bony structures of the chest wall become involved. The ribs begin to assume a more oblique position and

come closer together, until evidently the intercostal spaces are greatly diminished in width. Consequent with this collapse of the chest wall the drooping of the shoulder becomes much more pronounced, and if the contraction continues beyond a certain point, scoliosis of the dorsal spine develops with the concavity towards the side of the injury. In some cases of extensive and persistent pneumothorax, a similar sequence of events occurs, even without such involvement of the pleura. In these cases the extensive collapse of the lung over a prolonged period allows carnification to occur, so that when the air in the pleura is eventually absorbed, the lung is incapable of expansion, and therefore the surrounding structures must contract to obliterate the potentially vacant space.

It was found that apparent deformity occurred more frequently and to a greater degree when the right side of the chest was injured. This was evidently due to the rôle played by the diaphragm. In right-sided lesions the elevation of the dome of the diaphragm was strictly limited by the liver, which acted seemingly like a cork. Beyond a certain point it could not go, while on the left side, although naturally limited, the degree of intra-thoracic space which it could occupy was much greater than on the right side.

The treatment of this deformity was based on the principle that prevention would be more fruitful of results than correction after it had developed. Two points were of prime importance: first, the prevention and correction of the muscular atrophy; and second, to increase the power of expansion of the affected lung. It seemed reasonable to suppose that the muscles could be developed by avoiding or overcoming the disuse. This turned out to be the case. It was more difficult to promote the expansion of the affected lung. At first the usual blow-bottles were employed. These, however, developed the side of the unaffected lung more than the affected one. When the blow-bottles are used, the intra-pulmonary pressure is uniformly increased. Therefore the increased expansion would occur where the resistance was least—namely, in the healthy lung. As a result the healthy side became larger, while the affected side became relatively smaller, and the deformity more apparent.

It therefore suggested itself that it was important to splint the healthy side and to force the affected one to do more work. In order to accomplish this, a series of exercises was adopted as follows:

1. The sound side of the chest is splinted against the back of a chair with the arm of this side extended as far as possible and grasp-

ing a rung. Then the patient is instructed to take deep slow inspirations, meanwhile pressing the healthy side against the back of the chair, in order to prevent expansion of the sound lung. In consequence the injured side tends to expand more fully (five minutes). (Fig. 1.)

2. Dumb-bell exercises with a 4-lb. dumb-bell in the hand on the affected side, and a 2-lb. one in the hand of the unaffected side.

(*a*) Arms raising sideways and bending under the armpit and over to shoulder (five minutes).

(*b*) Lying on the back; arms raising from side to the vertical and lowering to the horizontal above the head (three minutes).

3. Ladder exercises. The arm of the affected side is fully extended above the head and the highest possible rung of the ladder grasped firmly. The patient is then instructed to take deep, slow inspirations, meantime pulling on the rung of the ladder with the arm of the affected side (three minutes). (Fig. 2.)

It soon became apparent that the sooner the exercises were started the better. Therefore, as soon as a patient had been out of bed for a few days and was capable of walking about without conspicuous distress, the first exercise was started, and as he gained strength, the others were added. It was found that usually at the end of the tenth day of exercise, a patient would be on the full schedule.

An essential part of the exercises was firm encouragement. The object of them was fully explained to the patient. On first commencing the course he was allowed to drop out and rest if he became at all exhausted. Such symptoms as pain and slight breathlessness were explained as being of no serious moment, and the former almost essential for recovery. It is very important that the physical instructor be intelligent and interested in the cases individually, and be under the direct supervision of a medical officer. Also he should realize that the patients are in a curative stage, which may be marred by too strenuous progress. When the patients became strong enough they were given general physical training in combination with the special exercises in order to reduce their "hospitalization" as much as possible.

The result of the use of these exercises was very satisfactory. In those cases which had atrophy of the muscles only, re-development was rapid and complete, while in those with more gross deformity, the improvement, although conspicuous, was not necessarily complete. There were a few cases in whom the deformity had progressed to an advanced degree before the exercises could

FIG. 1

FIG. 2

TABLE III.

Name	Date	Special notes	Muscular atrophy on side of injury	Difference in sides of chest	Shoulder drop	Spinal deformity
Pte. A. J., 41157. Hæmothorax (L.).....	26–8–17	Wounded				
	12–9–17	..	Latissimus dorsi and intercostals	Slight	Slight	None
	28–9–17	..	Increasing	1 in.	Increasing	..
	22–11–17	..	..	2 in.	½ in.	Moderate
	6–12–17	Special P.T.	..	..	..	..
	10–12–17	..	..	2 in.	½ in.	..
	20–2–18	..	Slight	*Nil*	⅛ in.	Slight
	2–3–18	..	Very slight, about	..	⅛ in.	"
Gnr. J. T., 21509. Pyothorax (L.).....	1–8–17	Wounded				
	9–9–17	Special P.T.	Pectoralis major and latissimus dorsi	2 in.	1½ in.	None
	10–10–17	..	Less	1½ in.	¾ in.	"
	20–11–17	..	Slight	¾ in.	⅝ in.	"
	13–12–17	..	Very slight	¼ in.	¼ in.	"
Pte. R. E., 233681. Pneumothorax (R.)...	15–6–17	Wounded				
	26–7–17	..	Pectoralis major and latissimus dorsi, and intercostals	..	..	..
	28–8–17	..	Progressive	..	..	..
	2–10–17	..	Unchanged	..	Slight	..
	28–11–17	..	"	1¼ in.	..	..
	7–1–18	Up for first time	"	..	Slight	..
	14–2–18	Special P.T.	..	..	1⅛ in.	Slight
	2–3–18	..	Much less	..	¾ in.	Very slight
	23–3–18	..	Very slight	*Nil*	⅛ in.	Unappreciable

be begun. In these further deformity was arrested, and a slight improvement occurred; but the bony changes were so pronounced that it was not considered possible to change them more than to a limited degree.

The early commencement of exercise in cases of empyema was of particular value. The patient was encouraged to get out of bed as soon as possible after the operation, and when the thorax was still draining, he started his exercise. At first the discharge would increase, but after a short time this would gradually become less, the drainage tube would be pushed out until eventually the sinus would close. During this time the expansion improved, the deformity and shoulder droop were reduced, and finally the two sides of the chest would be equal in size and movement.

A few typical cases are set forth in Table III in order to show the progress that usually occurs. It will be seen from these cases that there is a progressive diminution in the atrophy of the muscles and the degree of shoulder droop until the two sides are practically equal. This improvement is further demonstrated by the comparative outlines of the chest walls of those cases which are shown in Charts 1 to 3.

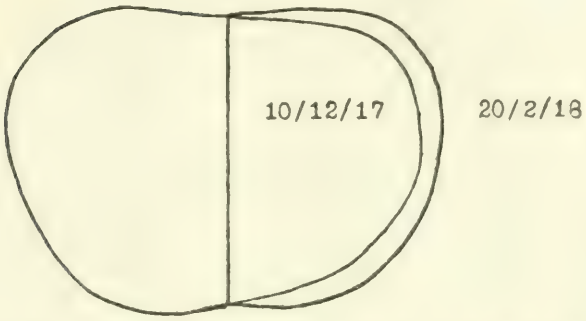
The effect of the retention of the foreign body in the lung was carefully followed. In forty-four cases (63 per cent.) there was clear evidence of retention of the missile. These are analysed in the following table:

TABLE IV

Position of foreign body	Number of cases	Removed	Remaining
In lung	35	1	34
In subcutaneous tissues	9	5	4

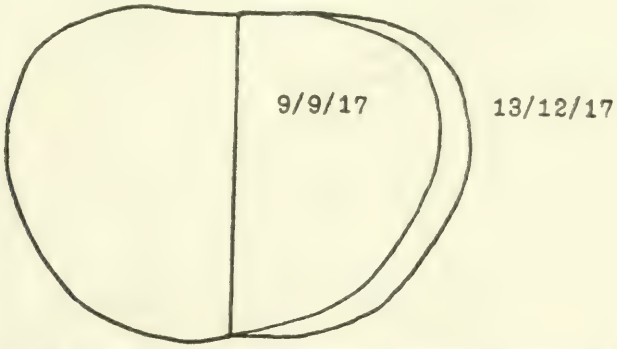
In the five cases where the foreign body was removed from the subcutaneous tissues, it was on account of pain. In only one of the thirty-five cases where the missile was in the lung tissue did any untoward symptoms arise. In this case an abscess developed about the foreign body, from which a sinus led to the wound of entrance. This abscess was situated in the upper part of the right lower lobe, and the sinus was directed downward and backward. The cavity did not completely drain, as periodically the discharge would cease, and there would be coincident rises of temperature. It was therefore considered necessary to remove it. It was localized by *x*-rays, and under nitrous oxide anæsthesia, long forceps were easily introduced into the cavity through the sinus, and the foreign

CHART 1



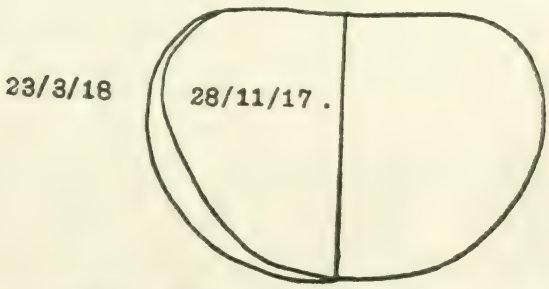
Pte. A. J., 41157. Left hæmothorax. Outline of chest wall before and after a course of special physical exercises.

CHART 2



Gunner J. T., 21509. Left pyothorax with operation. Outline of chest wall before and after a course of special physical exercises.

CHART 3



Private R. E., 233681. Right pneumothorax. Outline of chest wall before and after a course of special physical exercises.

TABLE V

Disposal	Number	Number traced three months after discharged	Present Status of Those Traced						
			B.E.F.	A. 3	B.	D. 1	In hospital	P. U.	Totals
Furlough I.	1	1	..	1	..	..	..	..	1
Furlough II (D[1])	47	29	9	7	7[4]	4	1[1]	1[2]	29
B.	4	2	..	..	2	..	..	..	2
Convalescent hospital	1	1	..	1	..	..	..	..	1
Auxiliary hospital	2	1	..	..	..	1	..	..	1
Trans. to other hospitals.	2	0	..	..	..	..	..	..	0
Remaining in hospital	7	0	..	..	..	..	..	..	0
Permanently unfit	6	5[3]	..	..	..	..	2[3]	3	5
Totals	70	39	9	9	9	5	3	4	39

[1] In hospital for removal of F. B. from subcutaneous tissue of back.
[2] Sent to Australia for "change."
[3] Two cases were invalided to Canada for further treatment other than for the intra-thoracic condition.
[4] One case is likely to be raised in category.

body, which was oblong in shape, was seized at one end and readily removed until it reached the skin, where a slight enlargement of the opening was necessary. After this, the patient made an uninterrupted recovery. In all of the other cases the presence of the foreign body in the lung exerted no untoward influence on the progress of the case.

The length of time that the patients were in hospital before returning to some form of duty or discharge from the army naturally varied within wide limits (from one to twelve months), the average being four and a half months. The period of stay under our care averaged three months, depending on the condition present, and in nearly every case this was in proportion to the deformity.

The disposal of the patients on the completion of treatment is set forth in Table V.

It will be seen that out of fifty-eight cases which were discharged from hospital, fifty-two were considered fit for some form of duty, and the great majority eventually for full duty. Only six cases were discharged from the army. These were considered unfit for further military service for the reasons given in Table VI.

TABLE VI

Name	Reasons for discharge from the Service	Present occupation
Pte. J. W. L....	Chest in good condition. Totally blind in right eye, with considerable pain, due to gunshot wound, and deaf in the right ear.	Munitions, 52 hours per week.
Pte. C. K.....	Chest in fair condition. But he had pronounced debility.	In hospital in Canada.
Pte. H. G.....	Extensive destruction of the left pectoral muscles at the time of injury. Inability to use left arm	In hospital in Canada.
Pte. W. C.....	Spondylitis deformans. Age 51.....	Light work, 45 hours per week.
Pte. W. T. B...	Pronounced deformity of chest, with displacement of the heart	Farming, 28 hours per week.
Pte. E. W. S....	Pronounced deformity of chest, with displacement of the heart	

Of these cases, therefore, only two were invalided from the army on account of conditions directly attributable to the intrathoracic condition.

The after-history has been determined so far in thirty-nine of the cases discharged. Examination of Table V shows that, of the thirty-four cases retained in the army, who have been traced, eighteen

(53 per cent.) are doing full duty; seven (20 per cent.) have been lowered in category; two (6 per cent.) remain in Category B as on discharge from hospital; five (15 per cent.) are still in training at command depots; while two (6 per cent.) are not available for duty at present. The present occupations and length of work per week of five cases who were discharged as permanently unfit are given in Table VI.

It is apparent that injury to the chest is not necessarily a conspicuous factor in invaliding soldiers from the army. Even when they are discharged from the army on account of the results of such an injury, they are still capable of doing a considerable amount of work each week in a civilian occupation. Amongst those cases which are not discharged from the army as permanently unfit, there is a good per centage who eventually return to full duty with little or no impairment in the degree of physical exertion which they are able to accomplish.

Conclusions

1. Deformity of the chest wall is a very important disabling after-effect of gunshot wounds of the chest.

2. This deformity follows most frequently prolonged involvement of the pleural cavity.

3. The early and persistent evacuation of fluid from the pleural cavity, either by aspiration or by operation, is of great importance in preventing the development of the deformity. Especially is this so in cases of hæmothorax.

4. The early use of special exercises is beneficial in preventing or overcoming this deformity.

5. The prognosis in this condition is exceptionally good under suitable treatment.

MEDICAL INSPECTION OF SCHOOL CHILDREN

By D. J. Dunn, M.D.

Medical Inspector of Schools, Edmonton, Alta.

IN introducing the subject of medical inspection of schools to this audience, I consider it a privilege and honour to do so, because I am satisfied that there is no other body of men as much interested in the welfare of the human family physically, mentally and morally, and who have the same opportunity to assist in the development of the human race along proper lines. For the assistance which the medical and dental professions have given and are giving to the accomplishment of these objects, allow me to thank you most cordially, as there has been no change in my attitude in this regard since the commencement of the work here.

At the beginning of the work, I felt as I do now that the amount of success obtained is in direct ratio to the amount of co-operation and assistance given the department by all those who have anything to do with the school pupils. The subject of medical inspection of schools covers a very wide range of thought and action, and is a topic so big and comprehensive that its discussion in a single paper can only be suggestive, with perhaps a little more stress laid upon some features of the work which have been more prominent than others during the time the work has been carried on here. Many practical men do not see the necessity of medical inspection of schools, of school nurses, of schools for mentally abnormal pupils, nor for any other innovations which have come to stay, and have become an important part of the world's progress and which should be assisted by all right minded and progressive individuals.

We hear a great deal of talk at the present time about the conservation of our natural resources, and rightly so, but that subject as discussed gives very little if any place to the conservation of the greatest asset of any nation, which is its children. What is the use of conserving our natural resources without giving due thought to the succeeding generation who are to use them?

"A sound mind in a sound body" is the ideal kept before us in

Read before the Alberta Medical Association, September 21st, 1916.

our work, and so to influence the generations as they pass along. An ideal which has impressed itself very strongly upon everyone who has gone into the subject carefully. However, it is to be hoped that before many years have passed, we will have the satisfaction of seeing our ruling bodies give as much care and attention to the rising generation as they now give to the development of the best strains of live stock. The only hope that this may be realized will be by such a body of men as I am now addressing, using their influence by word and act to bring this subject to the notice of the proper authorities. I am pleased to say, however, that the Government of Alberta has, during the past session, voted a sum to make a start along one branch of this work: that is the care of the mentally defective.

There never has been a time in the history of our country or of the empire when the conservation of the rising generation has been of as great importance as at the present time, when so many of the flower of our manhood and womanhood are laying down their lives in the cause of righteousness and freedom. This phase of the subject is all the more important in view of the fact that at the present time there is such a high percentage of loss of young lives before they even reach school age. What do the vital statistics of our city for 1914 tell us?

Out of a total of 608 deaths, 323 or over 50 per cent. occurred before five years of age.

Under one year, 287, or 47·2 per cent. of the total.

Between one and four years, thirty-six, or 53·12 per cent, before five.

Between five and fourteen, twenty-two, or 56·74 per cent., before fifteen years of age.

For the Province of Alberta for the year 1914 out of a total of 4,147 deaths, 1,738, or 41·66 per cent. occurred before the children were five years of age.

Under one year, 1,376, or 33·18 per cent.

Between one and four, 362, or 41·66 per cent., before five years.

Between five and fourteen, 224, or 47·31 per cent., before fifteen years.

Over 33 per cent. of the deaths occurred before the age of one year, and over 47 per cent. before the age of fifteen years.

These figures convey to my mind a serious state of affairs, and one which demands and is worthy of our very best endeavours to combat. This is especially true when a very large proportion of these lives could be preserved by those in charge being better informed as to the care of these little ones.

When such a large percentage of children die at this early age, it is all the more important that the health of those living should be well looked after. We may safely assume that many who live are badly maimed, and a proportion of these in later life will not be able to make their own way and thus become a charge on the community when they should be a tangible asset.

Medical inspection of schools is one branch of preventive medicine which has not yet come to its own, not saying that any branch of prevention has received the recognition that it should; but it seems very difficult to have individuals, let alone a community, appreciate what it has missed. In all medical inspection work the object to be kept in view seems to me to be to place every pupil who enters school in the best possible position to get the most out of his or her time there, or to put it in another way, to assist those in good health to keep up to the highest standard and assist those below normal in any way as much as possible, so as to give them the best chance they can be given.

We may ask ourselves the question: Should we allow the child to suffer and perhaps be handicapped for life through the ignorance or indifference of the parent? I do not think any of us would answer this question in the affirmative. We all know that this is the children's generation, and it is not very many years since the treatment of children received but very little attention. These children are the future parents and many of them would have a right to rise up and curse their parents as well as all others responsible for not doing their duty by them. When physical defects are interfering with the health and school progress of the pupil, authority should be given to see that the necessary treatment is carried out if the parents will not assume the responsibility. No cases here have gone untreated because the parents were poor.

The medical profession have done their part nobly. The pathetic side of this picture is that many parents whose children require treatment the most, appreciate it the least. This prejudice, however, is being gradually overcome, and parents are appreciating more and more what the department is endeavouring to do for their children.

Sickness and physical degeneracy more than any other single factor it has been said, is the cause of social dependency. In order to cope with present conditions and be able to maintain a livelihood, each individual must have a *sturdy physique* and be *prepared*. Physical defects retard mental development and prevent persons from being properly prepared for the battle of life. A very large

percentage of our school children suffer from decayed teeth and deformed mouths. The next most frequent defects being impaired throats and vision. Decayed teeth mean aching teeth, aching teeth mean germ-ridden mouths and germ-saturated food favouring the propagation of contagious diseases, poor mastication and digestion, impaired nourishment and bodily resistance, intestinal and general toxic absorption, all of which prevent proper intellectual advancement, and favour the various forms of physical disturbances and degeneration. Sir William Osler said in the *Lancet:* "If I were asked to say whether more physical deterioration was produced by alcohol or by defective teeth, I should unhesitatingly say, 'defective teeth.' It has been abundantly proved in Germany that where children's teeth are in good condition 'they become physically stronger, secure a higher average in their studies, and are easier to control and apparently happier.' "

Physical defects have a distinct bearing on school progress. If we assume that the average child without defects of any kind will complete the eight grades of the public school in eight years, how long will it take the physically defective child to complete these eight grades? A pamphlet issued by the Russell Sage Foundation on this subject brings out the following facts:

Physical defects present:	
Defective vision	8 years.
Carious teeth	8½ "
Enlarged tonsils	8 7-10 years
Adenoids	8 1-10 "
Enlarged glands	9 2-10 "

It is a matter of common observation that the brightest and most studious children have defective vision, but later disaster overtakes the child if the defect is not remedied.

Quoting again the Russell Sage Foundation: "Our expenditures for public education have more than doubled in the past ten years. No other investment produces so large a return. More money means better schools, better schools mean better citizens, better citizens mean more money. It is a benefit circle." It also came to the conclusion from its investigations that pupils were retarded from six months to one and a half years by a single physical defect. In the city of New York, during the first half-term of 1913, 189,840 children did not pass into the proper grades. Much of this was considered due to physical defects, including defective

teeth. The cost of re-educating these children, as we might term it, was $3,679,304.40. London authorities claim that it costs $25.00 per annum to educate one deaf child, whereas the normal child can be educated for $14.00.

The figures I have quoted for New York are very large, but we have the same conditions here, only in a very modified degree. What does this cost our community then in dollars and cents, leaving out all other considerations?

In 1915 there were about 1,100 pupils reported for defects, exclusive of defective teeth. Taking the average cost of the child per school year say at $40.00, which I believe to be not far astray, as Toronto has worked it out at about $31.50. Our 1,100, which is exclusive of defective teeth, assuming one year's retardation, costs the community $44,000.00. If this is the case, it certainly would pay the community to have these cases treated and pay much more than the ordinary fee charged by any medical man to do the work.

Is it fair to our children to allow any of them to waste one or two years of school life besides running the risk of incurable damage to physical development, their beauty, and their efficiency?

As to the doing of this work, there seems to be a difference of opinion as to how it should be carried out. It is probably the consensus of opinion that in a broad, general way the medical inspection of schools, except in the case of those diseases which menace the public health, is best carried on by the education rather than by the health authorities. Of course, the educational authorities should work in thorough harmony with the health authorities, and all health laws should be absolutely observed.

However, the main thing is *to do the work and to do it at once.* The above is the method which has been adopted here, and thus far has given good results. When the city health department discovers a case of contagious disease, the medical inspector of schools is at once notified, and the principal of the school in the district affected notified by mail. If a suspicious case comes under the notice of the school authorities, the city health department is notified. This immediately puts both departments in touch with these cases. Before returning to school after contagious disease, the pupil must present a certificate from the city health department.

It would be very unfair and practically impossible to leave this phase of the work without making a reference to the work of the "school nurse." She is our ablest assistant, without whose help a great proportion of our work would be in vain. In her contact with the parents and homes; persuading the parents to do

what they should for their children and giving instructions as to their care and to the general hygiene of the home, she is doing something which should be of great benefit in the future.

Another feature of this work which is of vital importance is dealing with the mentally abnormal child. The line between normal and abnormal pupils is an invisible one, and many of these could be well taken care of in special classes. As soon as the boards of education and the general public realizes the amount of time spent upon these with little or no result upon the pupils, other provision will be made for dealing with them. There is of course also the class who should not be admitted to our schools, but should be confined to an institution where they can be under supervision. Many of them may be prepared to be at least partially self-supporting. By dealing with them in this way, we eliminate the danger to society, as many of the children of such parents are mentally deficient. The children of any parents *may* be mentally abnormal, but the children of mentally deficient parents are *almost certain* to inherit this tendency.

Between 2 per cent. and 3 per cent. of the school population is defective mentally; that is more or less below normal intelligence. A very large number of children appear to be defectives, but are soon raised to a perfectly normal standard by having such physical defects as adenoids, deafness, visual abnormalities, etc., corrected, but about 2 per cent. will remain mentally abnormal, even after all physical defects are relieved. Of course, in every school-room there will be found children who are older than they should be for the grades they are in, owing to many causes, but the chief being irregularity of attendance due to illness, or having not had the opportunity to attend school. "Ayers" says that irregular attendance is the chief cause of backwardness in school and that non-promotion and ill-health are the chief cause of irregular attendance. These repeaters, as they are called, whether mentally defective or not, are apt to drop out of school early from discouragement and then join the ranks of the uneducated classes with a poor prospect before them, and many of them sooner or later drift into the criminal class of the community. When such children are placed in a class-room with reasonably normal and bright pupils, the teacher has to neglect either one or the other. It is impossible properly to educate them both at the same time, and consequently the child who is subnormal is usually neglected and stays in the same room term after term, to the disgust and discouragement both of teacher and scholars. Besides this, such

children are usually ill-tempered, vicious, upsetting the discipline and progress of an entire school-room. This is not justice to the teachers, to the scholars, or even to the poor defective himself. It is as clear as the noonday sun, that such children should be educated by themselves, where under special teachers, conditions and environments, they may be made to produce the best that is in each individual child. Therefore, there should be established in all towns and cities, schools for defectives, devoted exclusively to the uplift intellectually, physically and morally of defective children. These children should be educated either in separate buildings away from other children, or if this is not practicable, separate rooms set aside in the school buildings for their education. No school of this nature should accommodate more than twenty-five pupils, and a less number would be better. Teachers specially qualified for this class of work should, of course, be engaged and receive remuneration in accordance with the trying duties they have to perform. Many of these pupils could later on return to the public schools and to the grades to which they are best adapted. It is estimated that 25 per cent. of the inmates of feeble-minded asylums could be made normal by correction of physical defects and proper training, and that 40 per cent. could be made semi-normal.

Some people believe that it is foolish to waste time with feeble-minded and weakly children. How would any of these people feel if the life of his or her own child was at stake? It is certainly our duty, to prolong life and to alleviate human suffering and to see that those who live are made as strong as possible.

Go to a watch, gun, or instrument factory, and see what care is taken in inspecting each piece of material which is to go into the formation of the article. Nothing is neglected to procure the article of perfection. Are we as careful with our children to see that their bodies are made as perfect as possible? I fear not, and yet how much more valuable is a child than either a watch, gun, or a fine instrument, and how much more important it is that he should as nearly as possible reach physical, mental and moral perfection.

Whatever the expense of this work may be, it is cheaper, and better, and nobler to educate properly in suitable buildings, and to produce and maintain a high health standard, than it is to educate them under reversed conditions and to pay the money supporting criminal courts, reformatories, jails, hospitals, institutions, for the deaf, blind, and dumb, crippled, mental defectives, paupers, etc., etc., even if we have no ambition to produce a stronger race as one generation succeeds the other.

It must not be forgotten that a strong, virile, intellectual people is one of the greatest assets a nation can possess, not only in times of war, but also in times of peace, and each individual community should be willing to do its share in the general uplifting and improving and strengthening of the nation as a whole.

Nor does our obligation stop with our duty to the individual child. We are educating a nation. It rests with us to say whether the next generation shall become stronger than the one before; whether the race shall advance or retreat. The changes will very largely be brought about through the agencies of the public schools. Here the children come together and mingle, here they spend a very large proportion of their waking hours, here they receive the training and are surrounded by the environments which shall influence them in later life and where they begin to understand the nature of British citizenship. If, therefore, we wish to produce and perpetuate a nation of strong, virile, intellectual, and normal men and women, let us see to it that our public schools are in every way of the best possible character, and that they shall be improved from year to year to keep pace with modern methods and advanced science, for surely nothing is too good for the coming masters and mistresses of the nation.

The Hon. J. R. Boyle, minister of education, has appointed a board of examiners to make arrangements for holding the provincial examinations for nurses the first week in October. These examinations will provide means whereby nurses who have become residents of the province since the passing of the Registered Nurses' Act may become eligible for registration. Graduates of Alberta hospitals who were in training at the time of the passing of the act are not required to take the examination. Dr. Revell, dean of the faculty of medicine of Alberta University and president of the Alberta Medical Association, was appointed permanent chairman of the Board.

Editorial

THE NEED FOR CONSCRIPTION OF CANADIAN DOCTORS

THE recent passing of the Man-Power Bill in the United States has a direct interest to all Canadians who are keenly following the events of the War. To many of us it seems as though our American friends have seen and profited by our mistakes before we were willing to remedy the shortcomings of our lack of system. Our efforts have undoubtedly been great, but they have been to a great extent stultified by clinging so long to voluntary methods of securing the assistance the country needs. To no class of men does this apply as much as to doctors because the supply is limited and the demands great for both army and civilian needs.

The effect of the recent statute in the United States is to make all men between the ages of eighteen and forty-five liable to be drafted, with no limitations owing to marriage or personal responsibilities. How this will concern the supply of doctors is what chiefly concerns our readers. That it will have the effect of taking into the service more of the city and town physicians between the ages of thirty and forty-five is assured. This is the class that has hung back in America and Canada under the voluntary system. To these men undoubtedly fall the heaviest sacrifice when they leave their local work for a number of years. This would largely be made up, however, by the large earnings they have had since the War began, owing to the absence of so many of their confrères on active service. This is the class that must come forward to meet the pressing demand for doctors from now until the close of hostilities.

In Canada the voluntary enlistment of doctors has had the effect of leaving large sections of our population without

the aid of a physician within reasonable distance, and other sections with as many as they had before the War. This condition of affairs is intolerable if the country is to do its duty to our soldiers and civilians. The cleaning out of the country doctors in localities where the work is hard and the exposure great is undoubtedly due to the advantages the C.A.M.C. has to offer and to the fact that a practice in these districts may be secured with little effort after the War.

Great Britain had the courage to tackle this problem when it had reached a stage somewhat similar to what prevails in Canada to-day. This was done by conscripting the services of all physicians up to the age of fifty-six years. By the amendment to the Military Service Act of Great Britain passed last March, all doctors up to this age must either serve in the Army or practise their profession where the Minister of National Service thinks they are most needed.

The profession in Canada has been willing to have legislation passed that would remedy these defects and at the same time supply the medical officers needed for the Army. The Canadian Medical Association at its annual meeting in June, 1917, passed a resolution urging the Dominion Government to provide legislation conscripting the whole of the medical profession of Canada to supply the needs of the army and the civilians. Why the Government has taken no action in this matter is not generally known. It is probably due to its not being aware of the lack of doctors in some country districts and to the fact that the needs of the army for the past few months have been met by the conscription of the recent graduates of the universities. The medical school, however, cannot turn out doctors fast enough to provide the reinforcements necessary for the military work overseas and in Canada. The Medical Corps is so big now that the losses through death, wounds, and sickness necessitate a considerable number being sent over every month. In addition, men must be sent over to replace all the doctors returned to Canada for duty.

The profession themselves seem to have suggested the remedy for the trouble. The ideal solution would be to have the whole profession conscripted for service. Those doctors essential for civilian needs would be placed on the Reserve until their services were required. The outlying points where the need of doctors is urgent could be supplied by volunteers who would rather serve in private practice than do military work. If this failed to secure the required number for country work, some might be released from the C.A.M.C., subject to the condition that they practice in places designated by the authorities as badly in need of their services.

TORONTO is planning, on a huge scale, the reconstruction of St. Andrew's College into a military hospital. The present arrangement calls for an erection of twenty-five new buildings furnishing accommodation for over two thousand beds. The expenditure is estimated at $2,000,000. The hospital wings will be built in two clusters; one for convalescents, the other for hospital cases. Five convalescent cottages are planned with accommodation for nine hundred beds. A vocational building will be erected and also therapeutic and active treatment hospitals. The other buildings will be the hydrotherapeutic, surgical and neurological hospitals, and the administration, medical officers' and nurses' quarters. The ground covered will be twenty-five acres. The hospital, when completed, will be of a similar type to those the United States and French Governments are building. While it is not intended to be of a permanent character, it will be used for at least ten, or even twenty years, after the conclusion of the war for the treatment of invalided or incapacitated soldiers. The plans have been ratified by the Department of Public Works and the military authorities call for its immediate erection. When completed, the hospital will be the finest of its kind on this continent, and will also be the great demobilization centre for the whole of Canada.

The Canadian Red Cross has recently opened in Boulogne a Nursing Sisters' Rest Home for the comfort and convenience of the members of the nursing service. The whole environment is essentially home-like and restful, and the situation ideal. The primary purpose of the hostel is to provide accommodation for nurses travelling from England or France on duty or on leave. The facilities of this institution are extended to Nursing Sisters from Canada, Australia, South Africa, the United States, and the United Kingdom, and already several hundreds have enjoyed its hospitality. Colonel Blaylock, Commissioner of the Canadian Red Cross Society in London, first recognized the need for such an hostel, securing its establishment after obtaining the consent of the British authorities.

The annual conference of the Canadian Association of Nurse Education and the Canadian National Association of Trained Nurses was held this summer in Toronto, at which were assembled nurses representing the whole of Canada. The conference lasted five days and about one hundred and fifty visiting delegates were in attendance.

Miss Deans, a member of the National Committee of the Red Cross Service in the United States, gave a most interesting paper, stating that the nursing organization was so complete in every detail that a test made in 1916, in mobilizing a base hospital, was successfully met within twenty-four hours; the nursing personnel and physicians on the scene, tents set up and equipped, and all made ready to receive five hundred patients.

Dr. Helen MacMurchy's paper on "Universities and the Nursing Profession" quoted letters from Canadian universities touching on the desirability of giving university training to nurses.

Obituary

DR. JOHN TAYLOR GILMOUR

General and deep regret is felt over the sudden death of Dr. John Taylor Gilmour, of Toronto, which occurred on July 29th. He was strolling in his garden in the morning when he succumbed to an attack of heart failure. Dr. Gilmour was a public servant of whom the province might be proud. Prison reform in Ontario owes much to his judgement, intelligence, and kindness of heart. During the past twenty years his whole time has been given to the problem of handling men whom society has put behind the bars. Dr. Gilmour was warden of Toronto Central Prison from 1896 to 1913, and warden of the Ontario Prison Reformatory at Guelph, which has become a model for similar institutions in many parts of the United States. The reformatory was a new departure in prison life, and under Dr. Gilmour's regime many methods of reform were realized and splendid results obtained. He believed in the remedial effects of kindness, and held that the prison should not be a place of punishment, but a means of bringing the offender back to decent citizenship. He was regarded as an authority on the question and advocated his views in many letters and writings. He gave the Hon. W. J. Hanna the heartiest support in the great and successful experiment at Guelph. In 1904 he was President of the Warden's Association of the National Prison Congress. In 1908 he was elected President of the American Prison Association, being the first Canadian to hold this position.

Dr. Gilmour graduated from the medical faculty of Trinity University in 1878. Although he stood aside from politics after the wardenship, he had been previously Liberal member of the Legislature for West York from 1886 to 1894, when he became Registrar of Deeds for York. Last year he was appointed Commissioner of Parole for the Ontario Government, an office he was peculiarly well qualified to fill.

He is survived by his widow and two children, a son and daughter—the former is Lieutenant-Colonel Charles Gilmour, C.A.M.C., who has seen so much service overseas. To these a widespread sympathy is extended. But none will mourn him more deeply than those in whose service he spent a large portion of his life, and who owe that priceless gift, the restoration of self-respect,

to his firm belief that the power of kindness brings out the good that lies at the heart of every man. His most lasting memorial lies in the distinction of being known as the prisoners' friend.

The death of Dr. John E. Somers, which took place early in July, at Cambridge, Massachusetts, comes as a great loss not only to the community in which he resided, but to St. Francis Xavier's College, of which he was a generous benefactor and lifelong friend. He was born in Antigonish on September 5th, 1851. He attended St. Francis Xavier's College and thereafter taught in the public schools. He subsequently entered Harvard University and completed his course in Bellevue Medical College, New York. He eventually took up his residence in Cambridge, Mass., and for many years devoted himself almost exclusively to surgery. He was deeply interested in the Holy Ghost Hospital for Incurables, gave this institution much financial assistance, and was head of its medical staff. In 1905, St. Francis Xavier College, on the occasion of its fiftieth anniversary, conferred upon him the degree of LL.D.

It is in connexion with his benefactions to the College that the name of Dr. Somers will be loved and cherished. The two splendid buildings erected by him on the college grounds—the Somers' Chapel and the Somers' Gymnasium—in which he linked up the moral and physical well-being of the students with the development of their intellectual life, are fitting memorials of his well-balanced sense of true university education. To these donations must be added the establishment by him of a Chair of Classics in the same college in 1913. The enthusiasm he felt for the welfare of this institution he communicated to others. He was known far and wide as a physician of high standing, and a public spirited citizen who gave freely of his time and energy in behalf of all.

Captain James Tennant Whitworth Boyd, C.A.M.C., died on service at the age of twenty-seven; nephritis was the cause. He was born in Nova Scotia, and graduated M.D., C.M. at Queen's University, Kingston, in 1914. He was the son of the Rev. Andrew Boyd, of Port Arthur, Ontario. After serving for a year in the Kingston General Hospital, he enlisted in the Canadian Army Medical Corps and went overseas in 1916, being drafted to the No. 7 Canadian General Hospital (Queen's University Unit) at Etaples. He worked in the laboratory there till February, 1917, when ill-health necessitated his return to England. During the past fifteen

months he had been a member of the laboratory staff of the Kitchener hospital.

A SAD accident took place in the vicinity of Sudbury, when Dr. E. J. Leary lost his life by drowning. He was twenty-eight years of age, and a native of Cooksville. He was a member of the 1917 medical class of Toronto University, and, after graduation, he enlisted with the C.A.M.C., with which he saw two years' service in France. At the time of his death he was attached to the medical staff of the Canadian Copper Company.

THE Gatineau valley mourns to-day the passing of one of its most esteemed citizens in the death of Dr. James Pritchard. The doctor had undergone an operation in March from which he never fully recovered. A cold, contracted recently, caused congestion of the lungs and his ultimate death. He was a graduate of the school of medicine, Toronto University, and an honour graduate of McGill University. He was a prominent member of the Masonic Order. Dr. Pritchard was in his forty-ninth year, and had been practising medicine in the Gatineau valley for the past quarter of a century, where he will be sadly missed for his many excellent qualities, and for his big, bluff, genial ways which endeared him to the hearts of all.

MUCH regret was felt at the sudden death of Dr. Frank Mitchell, the result of a nervous breakdown occasioned by his long and continuous studies and war work. He was born in Meaford some twenty-five years ago, had only passed his final examination in May last, and was practising at the Asylum charge of a Convalescent Home at the time of his death. When war broke out he enlisted with the navy and was in active service for two years, returning about a year ago to complete his course. Owing to his service overseas, Dr. Mitchell was favourably recommended for special convalescent work. He was considered to have a brilliant future before him.

Miscellany

News

ALBERTA

Fifteen municipalities throughout Alberta are reported so far as desirous of taking advantage of the rural hospital legislation in the province, and these have made application to the minister of public health. The largest municipal hospital yet arranged for will be at Wainwright, where a scheme is now leading up to definite action. Vermillion, Mannville, and Lacombe are also getting their organization under way, and will build or otherwise arrange for hospital premises this year.

Dr. J. C. Miller, director of technical education of the province of Alberta, and principal of the institute of technology and art, in Calgary, where the province is training returned soldiers, has been called to the service of the federal board of vocational education of the United States to assist in re-educating its own disabled soldiers. He is severing his connexion with Alberta to accept the new post.

The first meeting of the council of the Alberta Association of Graduate Nurses was held recently at the Royal Alexandra Hospital, Edmonton. The report of the registrar was most satisfactory. There are three hundred and ten active and non-active members, of which a large proportion of the latter class are serving overseas. The council decided to offer to the board of management of each hospital in the province containing a hundred or more beds, a scholarship of $25 to be awarded annually to the pupil nurse making the highest percentage in practical work.

Increased provision for the care of tubercular discharged soldiers has been made in the three Western provinces and the latest departure is the new sanitorium to be erected at Bowness. Accommodation for about three hundred or four hundred patients is to be arranged in a series of thirty-two and fifty bed pavilions of the type suitable for ambulance cases, while infirmary accommo-

dation in proportion will also be added, the site being laid out with a view to ultimate expansion of five hundred beds. The sanitorium is the outcome of an arrangement between the Department of Soldiers' Civil Re-establishment and the provincial government, and it will be adaptable to the province's civilian requirements after the war.

MANITOBA

The Northwestern Manitoba Medical Association held its annual meeting on July 10th. A large number of practitioners from other fields were present and a most interesting session was the result. The President, Dr. O'Brien, was in the chair. Dr Fryer, of Virden, gave a paper on "Clinical methods and diagnosis", and Dr. Goodwin, of Elkhorn, presented several clinical cases from which developed interesting discussion. The officers elected for current year are: honorary president, Dr. O'Brien, Rossburn; president, Dr. F. A. Smith, Birtle; vice-president, Dr. Hudson, Hamiota; secretary-treasurer, Dr. Tisdale, Kenton; committee, Dr. Andrews, Minnedosa; Dr. Swallow, Russell; Dr. Fryer, Virden.

The half-yearly report of the Brandon Health Department has been submitted by the health officer, Dr. E. S. Bolton, and Sanitary Inspector Davies to the City Council. It shows the health conditions of the city as a whole satisfactory. There were no cases of typhoid fever during the last half-year. The total number of cases of infectious diseases reported were ninety-seven, of which fourteen were outside cases. Diphtheria had but one death. There were no deaths from the usual infectious diseases. Three deaths occurred out of ten cases of tuberculosis. The low sickness and mortality rates were due to the improved sanitary enforcements. The decrease in the infant death rate was a source of great satisfaction. It had been decreased by fifty per cent. when compared with the figures of 1917. This was due to the milk supply which was very satisfactory and there was no scarcity at present. Of the dairies inspected only one had to be regulated. The valuable cooperation of the Mayor, Magistrate Fraser, Mr. Kenneth Campbell, of the Children's Aid Society, and the Chief of Police had been of the greatest service to the Health Department and had been instrumental in bringing about improved conditions.

Dr. A. J. Douglas, the Winnipeg city health officer, is urging

the city to take steps for the erection of a small-pox pavilion on the grounds of the King Edward and King George hospitals on the plea that it would be more satisfactory, just as safe, and vastly cheaper than if isolated in some out of the way locality. He stated that the fundamental trouble was non-vaccination. He stated that diphtheria had caused the health department more trouble than any other disease. Sixty eight deaths resulted from 1,467 cases. In 1916 the deaths were 50 out of 1,281 cases. Carriers reported were 336 in comparison with 232 the year before.

SASKATCHEWAN

The eleventh annual convention of the Saskatchewan Medical Association closed July 18th. The election of officers resulted as follows: President, Dr. J. V. Cornell, Regina; first vice-president, Dr. Hart, Indian Head; second vice-president, Dr. Valens, Saskatoon; secretary-treasurer, Dr. Turnbull, Regina; executive, Drs. Rothwell, Regina; Ramsay, Moose Jaw; and Wright, Saskatoon.

Dr. Blanchard, of Winnipeg, gave the concluding address on the work of the C.A.M.C. in France.

A. B. Cook, president of the Saskatchewan Anti-tuberculous League, accompanied by about a hundred citizens of Regina, recently conducted an inspection of the Sanitorium at Fort Qu'Appelle. The Sheriff gave some idea of the work that is being done by the league in his remarks to the assembly. He spoke of the dangerous menace of tuberculosis to Saskatchewan. In that province there were approximately 25,000 cases of active tuberculosis and the death rate was one a day. It was an alarming but a correct thing to say that seventy-five per cent. of the people of this country have tuberculosis, not necessarily active, but in the system, merely waiting a favourable opportunity for development.

He outlined present conditions of the Sanitorium and the extensions and improvements which were being planned. He stated that both provincial and federal governments had been generous in the matter of grants. The provincial government has given $210,000, and will give about $150,000 this year. So far the federal government has not actually made a grant, but would give $175,000 this year. Sheriff Cook concluded by stating that there would be as time went on, an increase in the number of patients unable to afford the cost of treatment and they were asking the government and the municipalities to guarantee the cost.

At the examinations for the school of medicine, in July, at the University of Saskatchewan, twenty-two candidates from the province were enrolled. Four for medicine, eleven for dentistry, seven for veterinarians.

Dr Turnbull, medical health officer of Moose Jaw, states that after seventeen months, the epidemic of measles is apparently over. The average number of cases during the last five weeks has been only one per day, the end of the epidemic coinciding with the closing of the schools. For the month of July the birth rate in the city has been 23·49 per thousand per annum, of the estimated population. The total death rate had been 8·9 per annum. Infantile deaths had been 122, which was the highest rate this year and above the average for the past two years. There had been an increase in tuberculosis, there having been already fourteen deaths from this disease in 1918 as compared with eleven for the whole of last year. In the Child Welfare department twenty-seven new cases had been placed on the books entailing one hundred and five visits from the district nurse.

Regina's city health department resumed this summer and extended the Baby clinic. Three clinics were held weekly and in different parts of the city, to which mothers were invited to bring their children for examination. A doctor and nurse were in attendance at each.

Miss Traquair, previously matron of the Military Isolation Hospital, together with Miss Gilroy and Miss Bunn, who have been on the staff of the Ross Military Hospital, left Regina for Winnipeg, in command of Miss Sheppherd, who had previously occupied the responsible positions of matron of St. Chad's and of the Saskatoon Military Hospital. All are going to secure equipment and expect to leave for duty overseas in connex on with the C.A.M.C.

ARMY MEDICAL SERVICES

The following are among the officers brought to the notice of the Secretary of State for War for valuable services rendered in connexion with the war: Colonel G. W. Badgerow, C.A.M.C.; Major C. Macpherson, M.D., Royal Newfoundland Regiment; Colonel A. Primrose, C.A.M.C.

Captain A. S. Hayche, who has been with the Royal Army Medical Corps shortly after the outbreak of the war, and who was wounded three times on May 28th, has been awarded the Military Cross, with an extra bar, for conspicuous bravery under fire. Captain Hayche graduated in medicine from McGill University.

Temporary Captain Frank Muir Walker, M.B., R.A M.C., received the Military Cross for special devotion to duty under fire, from Prince Arthur of Connaught, who distributed a number of medals and decorations to Canadian soldiers on his recent visit to Toronto.

Lieutenant-Colonel W. G. Anglin has been appointed chief medical examiner for the Kingston district for the Board of Pension Commission.

The medical staff of Carling Heights has been reorganized, and Captain J. Johnston is appointed senior medical officer of the Western Ontario Regiment, assisted by Lieutenants D. G. Brain, W. P. Boles, M. C. Morrison and C. W. Pennecott; Major W. A. Burgess is detailed for duty as medical officer for the district depot, vice Captain C. M. Keiller.

Nursing Sister Lloyd has been appointed in charge of a new hospital that is to be opened up at the Aviation Camp at Deseronto, under the direction of the Royal Air Service.

Major Kenneth Mundell is to be appointed to the command of a new hospital, to be known as the Rathbun Military Hospital. All R.A.F. cases will be treated there, and removed for convalescence.

Temporary Captain E. L. Warner, C.A.M.C., relinquishes his appointment as Deputy Assistant Director of Medical Services. Lieutenant-Colonel E. J. Williams, D.S.O., to be temporary Colonel. Temporary Lieutenant-Colonel D. Donald to command a Canadian Stationary Hospital, vice Lieutenant-Colonel G. D. Farmer. Temporary Major T. H. Macdonald to be temporary Lieutenant-Colonel. Temporary Major W. M. Hart, M.C., to be acting Lieutenant-Colonel whilst commanding a special hospital. Temporary Captains to be temporary Majors: H. Orr, S. J. Streight, F. W. Tidmarsh, R. Pearse. Temporary Major E. V. Hogan to be temporary Lieu-

tenant-Colonel. Temporary Captain G. Shanks resigns his commission. Temporary Lieutenants to be temporary Captains: J. R. Brais, A. F. McGregor, C. A. Wells, J. W. MacKenzie, N. W. Furey, A. E. Mackenzie, J. H. Howell, Y. Blayney, J. W. Reddick, P. D. McLarren, C. G. Sutherland, H. A. Des Brisay.

Captain Edgar Douglas, C.A.M.C., Vancouver, has been awarded the Military Cross for directing his relay of bearers under heavy shell fire, and, though wounded, remaining on duty until relieved.

The following Canadians of the Army Medical Corps have been awarded the Meritorious Medal: S.-Sgt. J. R. Surman, C.A.M.C.; Pte. T. F. Lean, C.A.M.C.; Lce.-Cpl. C. F. Davis, C.A.M.C.; S.-M. C. H. Ward, C.A.M.C.; S.-Sgt. J. B. Riddell, C.A.M.C., Cpl. (A.-Sgt.) P. Riley, C.A.M.C.

Dr. McCormick, of Toronto, who has been missing for some time, is now reported a prisoner in Germany, a cable having been received from him a short time ago. He obtained a commission in the Royal Army Medical Corps and in 1917 proceeded to France. He was at first attached to the 25th Field Ambulance, and later appointed medical officer to the 2nd Battalion, Lincolnshire Regiment, to which unit he was attached at the time he was taken prisoner.

CASUALTIES

Died of Wounds

Captain W. F. McIsaac, C.A.M.C.
M. A. McKechnie, C.A.M.C., of Walkerton, Ontario

Died on Service

Captain J. T. W. Boyd, C.A.M.C., of Nova Scotia

Wounded

Lieutenant-Colonel D. Donald, C.A.M.C.
Major G. S. Mothersill, D.S.O., C.A.M.C.
Captain J. C. Eager, C.A.M.C., of Watertown, Ontario
Captain J. D. W. H. Barnett, C.A.M.C.
W. J. Sobey, C.A.M.C., of les Gatlos, Ontario
D. S. Campbell, C.A.M.C., of Woodside, Nova Scotia
A. E. McKusker, C.A.M.C., of Regina
F. B. Lobb, C.A.M.C., of St. John, New Brunswick

Book Reviews

THE SYSTEMATIC TREATMENT OF GONORRHŒA. By N. P. L. LUMB, temporary Captain, R.A.M.C. 116 pages. Price, 4s. 6d. net. Publishers: H. K. Lewis & Co., 136 Gower Street, London, W.C.

THIS little volume deals especially with the treatment of gonorrhœa and that only in the male patient. This should have been stated in the title.

It has grown out of the so-called "official" campaign against venereal disease. Captain Lumb bases his treatment on extensive personal experience with a large number of cases in military practice.

We wish the book all possible success.

THE ACTION OF MUSCLES, INCLUDING MUSCLE REST AND MUSCLE RE-EDUCATION. By WILLIAM COLIN MACKENZIE, M.D., F.R.C.S., F.R.S.E., member of the Council of the Anatomical Society of Great Britain and Ireland and of the staff of the Military Orthopædic Hospital, Shepherd's Bush, London. 249 pages, with illustrations. Price 12s. 6d. net. Publishers: H. K. Lewis & Co., 136 Gower Street, London, W.C., 1918.

THIS volume is a study of muscular action in health and disease, mainly from the physical standpoint. It does not purport to be a treatise on the physiology of muscular tissue, else we should ask why there is no discussion of the voluntary tetanus, central and peripheral inhibition of muscle or reciprocal innervation. It is, however, a little surprising to find no mention of Professor Shirrington's work on the inhibition of muscular tone. Tonus is recognized, and its relations to so-called muscular rest are fully appreciated, but a full preliminary discussion of muscular tonus and its dependence on innervation would have rendered very clear a great deal that it is referred to in connexion with paralyses and the remedial measures for them.

The book gives valuable information in a department of physiology which teachers do no deal with at all or take for granted. As a matter of fact, there is in medical circles a great deal of ignorance about the very subjects dealt with in this treatise.

The book has many excellent diagrams and photographic illustrations. The remedial methods appropriate to the various disabilities are dealt with fully and in a practical fashion.

We presume that "logical" is a mistake for "physiological" in the following sentence (p. 237): "A relative inequality in action between the right and left sides (of the diaphragm) can be regarded as having a pathological and not a *logical* basis."

D. Fraser Harris, M.D.

A Diabetic Manual for the Use of Doctor and Patient. By Elliott P. Joslin, M.D., assistant professor of medicine, Harvard Medical School. 179 pages, with illustrations. Publishers: Lea & Febiger, Philadelphia and New York, 1918.

This book is what it purports to be, a practical manual dealing with diabetes.

It includes everything that need be known about the dietetic aspects of this disease. It does not discuss physiological theories of glycogenesis; and Bernard's name does not occur in the index! The amount of glycogen in the liver cannot be called "an extremely small percentage", as is stated on page 51.

It condescends to full details about food for diabetic patients, and has some exceedingly useful tables showing the percentage composition and caloric value of a large number of available food substances. The selected laboratory tests useful in modern diabetic treatment form a valuable appendix. A diagram of the instruments used in collecting and analyzing the alveolar carbon dioxide would have been useful. The type, paper, binding, and general "get up" of the volume are in the best taste.

D. Fraser Harris, M.D.

Animal Parasites and Human Disease. By Asa. C. Chandler, M.S., Ph.D., instructor in zoology, Oregon Agricultural College, Corvallis. 533 pages, with illustrations. Publishers: John Wiley & Sons, New York, 1918.

We give this volume the heartiest welcome. Its objects can

best be understood from the following quotation from the preface: "It is the aim of this volume to present the important facts of parasitology . . . in such a manner as to make it readable and useful, *not* primarily to the parasitologist, but to the public health and immigration service officers; to the physicians who are concerned with something more than their local practice; to teachers of hygiene . . . ; to college and high school students; to the traveller; and to the farmer or merchant who is interested in the progress of science and civilization."

Among other important things the war has taught us is the importance of science in daily life—accurate knowledge of the visible and invisible worlds in which we move and live. Not all our numerous diseases and worries are due to vegetable parasites or "microbes", many arise from the presence in the body or on the body of animal parasites. Dr. Chandler tells the story of all these in an interesting fashion. There is no excuse now why any educated person should remain in ignorance of the relations of mosquitoes and their animal parasites to human malaria and yellow fever. Much of the book reads like a romance—is a romance founded on Nature's own "ultimate reality". The illustrations are admirable.

D. Fraser Harris, M.D.

Tumours, Their Nature and Causation. By W. D'Este Emery, M.D., B.Sc., director of the Laboratories, King's College Hospital. Price 5s. net. Publishers: H. K. Lewis & Co., 136 Gower St., London, W.C. 1, 1918.

This little book is virtually a well reasoned appeal for the recognition of the possibility of the truth of the parasitic origin or causation of cancer. Dr. Emery is a candid, guarded and well-informed writer on the causation of tumours.

There is no index; but it would seem that the views of Sir John Blaud-Sutton on tumours are not reckoned with.

The book must be read carefully, for it is written carefully. It contains no illustrations.

The expression "immunity to" is found on page 97; if "to" must be the word used, let the expression be "resistance to"; we are surely immune *from* things.

MEDICAL DISEASES OF THE WAR. By ARTHUR F. HURST, M.A., M.D., F.R.C.P., temporary Major, R.A.M.C.; physician and neurologist to Guy's Hospital. Second edition, revised and enlarged. Price, 12s. 6d. net. Publishers: Edward Arnold, 41 Maddox Street, London, W., 1918.

THIS is one of the most suggestive books which, as medical by-products of the war, has yet appeared. It will be read and referred to long after the war is over. The purely medical chapters —those dealing with the infections, beri-beri, tetanus, soldier's heart, war nephritis and gas-poisoning—are valuable because so completely up-to-date.

But what makes the work so fascinating is the way in which Dr. Hurst—previously well known as Hertz of Guy's—applies his physiological knowledge to the solution of the many problems in the disordered functions of the nervous system which this most violent of all wars has created. Some of these are: emotional neurosis, neurasthenia, psychasthenia, hysterical deafness, and blindness, aphasia, automatism, and even double personality. The great remedial value of hypnotism with mental suggestion is fully established. Dr. Hurst is evidently no blind worshipper at the altar erected to the man from Vienna—Frewd—of whose system he sagely remarks that what is good in it is not new, for the value of confession by a mind diseased has been recognized and utilized from the earliest times.

The howl of holy horror raised by the metaphysicians can be well imagined when they are told that Dr. Hurst takes it for granted in his opening pages that motions and other mental states can be and are, repeatedly, true or "exciting causes" of bodily changes. In some quarters this is a "heretic, damnable error".

The other points of interest which might be alluded to are: retraction of dendrites of cerebral neurones used to explain certain abnormal mental states, the importance of vitamines in diets, and the great saving of life through inoculation against typhoid fever.

D. FRASER HARRIS, M.D.

THE NAUHEIM TREATMENT, IN ENGLAND, OF DISEASES OF THE HEART AND CIRCULATION. By LESLIE THORNE THORNE, M.D., B.S., M.R.C.S., L.R.C.P., late medical officer London County Council Technical Education Board. Fifth edi-

tion. 160 pages. Price 5s. net. Publishers: Baillière, Tindall & Cox, 8 Henrietta Street, Covent Garden, London, 1918.

This is a refreshing book. It proves to us fully that the treatment of baths, etc., known as the Nauheim treatment, can be carried out in England (or for the matter of that, in New England) just as efficaciously as in Germany. This is satisfactory for more than one reason. The value of blood-pressure records is made very evident. The so-called resistance exercises are well illustrated.

Manual of Vital Function Testing Methods and their Interpretation. By Wilfred M. Barton, M.D., associate professor of medicine, Georgetown University. 311 pages. Price, $2.00 net. Publishers: R. C. Badger, The Gorham Press, Boston; The Copp Clark Co., Toronto, 1917. Second edition.

The table of contents of this book promises a rich feast in the realm of modern clinical chemistry. Much of it is valuable, though in the nature of the case a compilation. That the book has proved useful there is no doubt as before us is its second edition.

The laboratory tests in diseases of the liver, kidney, pancreas, and heart are fully dealt with; but nothing whatever is said about diseases of the stomach. We had to look twice at the index to be certain that the word "stomach" did not occur in it. This is a grave omission. The chemistry of disordered gastric function is the oldest branch of clinical chemistry and unquestionably one of the most important.

The much more academic subject of the endocrine glands is gone into thoroughly. Here and there are tiresome allusions to tests or methods which are at once dismissed as too elaborate or obsolete. On page 114. "Wheatstone's bridge" is described as a "whetstone bridge", which is not only nonsense but disrespectful nonsense. Wheatstone's name should at least have had its capital letter.

German and Austrian medicine is quoted just about as much as is bearable in the fifth year of the war.

D. Fraser Harris, M.D.

MEDICAL ELECTRICITY. A Practical Handbook for Students and Practitioners. By H. LEWIS JONES, M.A., M.D., F.R.C.P., late consulting medical officer ot the electrical department in St. Bartholomew's Hospital. Seventh edition. Revised and edited by LULLUM WOOD BATHURST, M.D., physician in charge of electrotherapeutic department, Royal Free Hospital, London. 561 pages, with illustrations. Price, 15s. net. Publishers: H. K. Lewis & Co., 136 Gower Steet, London, W.C.1, 1918.

IF any one, after going through this book carefully, fails to understand the medical uses and applications of electricity, the fault must be with himself. For the book is very clearly written and splendidly illustrated, there being no fewer than 197 illustrations. The sections on ionic medication and diathermy are particularly valuable.

SYPHILIS AND PUBLIC HEALTH. By EDWARD B. VEDDER, A.M., M.D., Lieutenant-Colonel, Medical Corps, United States Army. Published by permission of the Surgeon-General, United States Army. 300 pages. Price, $2.25. Publishers: Lea & Febiger, Philadelphia and New York, 1918.

THERE has certainly been no lack of trouble on the part of the author to bring together all the possible data which could in any way help to throw light on the great problem of syphilis and the public health. This admirable volume appears at a moment when what we might call the "official" conscience has been awakened to the prevalence of syphilis, the large number of its innocent victims and the possibility of a national campaign against it. Colonel Vedder's own summing up of Chapter II contains the gist of the matter: "any sanitary measures taken for the prevention of syphilis which do not include some method for treating the problem of prostitution are doomed in advance to failure, since they will ignore the main source and root of the disease."

The book supplies such accurate and up-to-date knowledge on every possible relationship of syphilis to the individual and to the community both the military and the civilian, that it cannot fail to be a factor in creating a properly informed public opinion.

Already there is a campaign against the "quack".

The book closes with a valuable appendix on the technique

of the Wassermann test. The type, paper, and binding are excellent. There are no illustrations.

D. Fraser Harris, M.D.

Aids to Rational Therapeutics, with U.S.A. Pharmacopœia Equivalents. By Ralph Winnington Leftwich, M.D., C.M., M.R.C.S., late assistant physician to the East London Children's Hospital. 228 pages. Publishers: Baillière, Tindall & Cox, 8 Henrietta Street, Covent Garden, London, 1918.

This is an attempt to give the treatment of diseases brought together in what might be called natural groups. Thus we have such groups as the hæmorrhagic, which, of course, includes such conditions as hæmoptysis, hæmatemesis, dysentery, hæmophilia, purpura and epistaxis, in all of which bleeding is the common factor, although they are diseases of very different systems and organs. There is much to be said in favour of this "rational" classification; it presumes only such a knowledge of physiology as ought to be possessed by every student who reaches the study of therapeutics.

One result of this way of dealing with diseases is that it leaves a large number of heterogenous diseases as "ungrouped". These have nothing in common with each other, save the initial letter of their names, *e.g.*, we have cancer, carbuncle, conjunctivitis, and constipation all dealt with in one innominate group. But, after all, no real harm is done because any one in a hurry to turn up the treatment of a given disease would turn up the name of the disease in the index and not concern himself in the least with the disease dealt with just before or just after the one he was in search of.

There is an interesting personal note running throughout the book. The practical directions to physicians as to how they ought to comport themselves in the sick-room are excellent; they are the headings for a lecture in medical ethics. We do not see why the directions should have been limited to thirteen. The size of the book permits it to be carried in the pocket, a very important thing in a book dealing with treatment. It is possibly one of the few, very few, treatises on therapeutics where the author not only quotes a comic opera librettist but also makes jokes entirely "on his own".

D. Fraser Harris, M.D.

TRANSACTIONS OF THE AMERICAN UROLOGICAL ASSOCIATION. Sixteenth Annual Meeting at Chicago, April 2nd, 3rd, 4th, 1917. Vol. XI. Published by Richard Fotheringham O'Neil, and others. Printed for the Association at the Riverdale Press, Brookline, Mass., 1918.

THIS volume contains, amongst other papers, the following:—chronic prostatitis; treatment of carcinoma of genito-urinary tract with radium; the verumontanum; several on median bar obstruction; diverticluum of the bladder; new growths of testis; sources of pus in urine; and cystoscopy.

The illustrations are beyond criticism and are numerous. We do not like "chronic" cut down to "chr.", as there is no reason for haste.

It is surely unnecessary to allude to the middle lobe of the prostate as "Home's gland"? Only the initiated could tell what were "the glands of Albarran": this usage savours of affectation.

We think "Röntgenogram" an ugly synonym for skiagram or radiogram.

Books Received

THE following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

A MANUAL OF OTOLOGY. By GORHAM BACON, A.B., M.D., F.A.C.S., formerly professor of otology, College of Physicians and Surgeons, Columbia University, New York, assisted by TRUMAN LAURANCE SAUNDERS, A.B., M.D., assistant professor of laryngology and otology, College of Physicians and Surgeons, Columbia University. Seventh edition, revised and enlarged, with 204 illustrations. Publishers: Lea & Febiger, New York and Philadelphia, 1918.

THE STATICS OF THE FEMALE PELVIC VISCERA. Vol. 1, in which the evidence of pathology, phylogeny and ontogeny, and clinical investigation, etc., is surveyed. By R. H. PARAMORE, M.D., F.R.C.S. 369 pages, with 26 illustrations. Price, 18s. net. Publishers: H. K. Lewis & Co., 136 Gower Street, London, W.C., 1918.

THE PROTEOMORPHIC THEORY AND THE NEW MEDICINE. An Introduction to Proteal Therapy. By HENRY SMITH WILLIAMS, B.Sc., M.D., LL.D., member of the National Committee for Mental Hygiene. 304 pages. Publishers: The Goodhue Company, 104 East 40th Street, New York, 1918.

EQUILIBRIUM AND VERTIGO. By ISAAC H. JONES, M.A., M.D., laryngologist, Philadelphia General Hospital. With an analysis of pathologic cases by LEWIS FISHER, M.D., laryngologist and otologist, Mt. Sinai Hospital, Philadelphia. Adopted as standard for medical division, Signal Corps, Aviation Section, by Surgeon-General, and Chief Signal Officer, U.S. Army. 432 pages with 130 illustrations. Price, $5.00. Publishers: J. B. Lippincott Company, Philadelphia, London, 201 Unity Building, Montreal, 1918.

NAVAL HYGIENE. By JAMES CHAMBERS PRYOR, A.M., M.D., medical inspector, U.S. Navy. 471 pages with 153 illustrations. Price, $3.00 net. Publishers: P. Blakiston's Son & Co., 1012 Walnut Street, Philadelphia, 1918.

THE ERRORS OF ACCOMMODATION AND REFRACTION OF THE EYES AND THEIR TREATMENT.—A HANDBOOK FOR STUDENTS. By ERNEST CLARKE, M.D., F.R.C.S., ophthalmic surgeon to the King George Hospital, etc., Fourth edition, 231 pages. Price, 6s. net. Publishers; Baillière, Tindall & Cox, 8 Henrietta Street, Covent Garden, London, 1918.

CLINICAL CASE TAKING. An Introduction to Elementary Clinical Medicine. By ROBERT D. KEITH, M.A., M.D., formerly principal of the King Edward VII. Medical School, Singapore. 96 pages. Price, 3s. 6d. net. Publishers; H. K. Lewis & Co., 136 Gower Street, London, W.C.

PRINCIPLES AND PRACTICE OF INFANT FEEDING. By JULIUS H. HESS, M.D., professor and head of the department of pediatrics, University of Illinois College of Medicine, etc. 323 pages with illustrations. Price, $2.00 net. Publishers: F. A. Davis Company, Philadelphia; English Depot, Stanley Phillips, London, 1918.

Medical Societies

SEVENTH ANNUAL CONVENTION OF THE PUBLIC HEALTH SERVICES OF THE PROVINCE OF QUEBEC

A SUCCESSFUL meeting of this Association was held in Fraserville, on July 26th and 27th. The programme included many important questions which brought up interesting and at times lively discussions. A feature which attracted much attention was the antituberculosis travelling exhibit of the Provincial Board.

Among the important questions discussed were: the venereal disease problem, statistics, public health nurse, teaching of hygiene in all the schools of the province and their medical inspection.

The paper on venereal diseases was delivered by Dr. E. Pelletier, secretary-director of the Superior Board of Health of the province, and the discussion was made by Drs. P. C. Dagnault, Ed. Laberge, J. A. Hutchinson, Arthur Simard, E. M. A. Savard, and M. J. Simard.

A good paper on the vital statistics of the Province of Quebec was presented by Dr. W. Bonnier, the statistician of the Provincial Board. It was discussed by Dr. E. Gagnon, G. E. Marquis, chief statistician of the Provincial Government, M. J. Simard and Dr. E. Pelletier.

The activities of the Public Health Nurse were fully explained by Dr. J. A. Baudouin, and his paper was discussed by Dr. J. O. Leclerc, Nurse M. H. Doiron, Drs. Ed. Laberge, J. A. Jarry, C. R. Paquin, E. M. A. Savard, E. Pelletier, Arthur Simard and E. Gagnon.

Honourable Mr. C. F. Delage, Superintendent of the Department of Public Instruction of the Province, highly endorsed the necessity of the teaching of hygiene and the general medical inspection of all the schools of the province.

The following resolutions were carried by the Congress:—

1. That paratyphoid fever be added to the list of contagious diseases to be reported.

2. That the law be amended to the effect that the municipalities be obliged to pay the expenses incurred by sending the Health

Officer to attend the Annual Meeting of the Congress of the Public Health Services of the Province.

3. That the Minister of Militia be invited to have the returned soldiers examined as to the existence of venereal diseases in Europe, and not when they have come back to this side of the Atlantic.

4. That the Superior Board of Health take the proper steps to see that the soothing syrups be analyzed and labeled as poison.

The next Convention will be held in Hull.

The officers are as follows:—Dr. Ed. Laberge, Montreal, president; Dr. U. Archambault, Mayor of Hull, vice-president; Dr. H. Palardy, District Inspector for the district of Hull, general secretary; Dr. J. Isabelle, Medical Officer of Health of Hull, local secretary.

THE NEW BRUNSWICK MEDICAL SOCIETY

The New Brunswick Medical Society held its annual meeting in St. John, on July 16th and 17th.

A very fair representation of the profession of the province was present, together with Dr. Powell, Montreal, Dr. Miner, of Calais, Me., Dr. Gordon, Montreal, and Dr. Nicholls, of Halifax, N.S.

The president, Dr. F. H. Wetmore, of Hampton, N.B., occupied the chair. In his address, he called attention to the fact that this was the thirty-eighth annual meeting of the Society, and of the thirty-seven members present at the first meeting, only seven were now living. He also made special reference to the demise, during the past year, of Dr. T. D. Walker, in middle life, long a valued and enthusiastic member of the Society, and of Dr. Boyle Travers, in the plentitude of years and a member of the first medical council of the province.

He referred with pride to the large number of members who have gone "overseas" in the interests of Canada and the Empire. He noticed the advance that had been so lately made in the treatment of septic wounds, and dwelt with satisfaction upon the prospect of an improved public health administration for the province. In this connexion he especially looked and hoped for a better control of tuberculosis and venereal diseases.

It was ordered by the Society that the President's address be published.

The succeeding programme was a pretty full one, and included

papers on "Vital Statistics", by the Hon. Dr. W. F. Roberts; "Medical Camping Grounds of To-day," by Dr. D. R. Moore; "Advanced Tuberculosis," by Dr. H. A. Farris; "The More Common Causes of Retention and their Treatment," by Dr. R. E. Powell, of Montreal; "A Talk on Pus Pelvis in a series of Five Hundred Laparotomies," by Dr. Miner, of Calais, Me.; "A Basis for Symptoms," by Dr. Gordon, Montreal; "Medical Research and the Great War," by Prof. A. G. Nicholls, of Halifax; "Vaccination against Experimental Poliomyelitis," by Dr. Abraham; "Enlarged Prostate," by Dr. W. W. White; "Congenital Hip," by Dr. G. A. B. Addy; "Cystoscopy," by Dr. Macaulay; "Common Diseases of the Nose and Throat in Relation to General Medicine," by Dr. Chipman; An *X*-ray demonstration by Dr. Allingham; Case reports by Dr. L. G. Penault; and medical and surgical clinics by Drs. Rowley, Barry, Emery and Curren.

Some amendments relative to the procedure of the Society meetings, looking to greater efficiency and interest were proposed by a committee having the matter in hand, and were adopted by the Society.

The Society will meet next year in St. John, on the second Tuesday of July.

Dr. Bentley, Registrar of the Council of Physicians and Surgeons of New Brunswick, reported Dr. J. E. Hache, Dr. E. A. Arseman, Dr. F. J. Donnelly and Dr. F. W. Stevenson as having passed the Council's examination for registration in New Brunswick. He announced that the medical register for the province contained two hundred and nineteen names.

The officers of the Society for the year 1918-19 are: George G. Melvin, president, St. John; H. S. Bentley, first vice-president, St. John; Hon. W. F. Roberts, second vice-president, St. John; J. D. Lawson, treasurer, St. Stephen; C. J. Veniot, recording secretary, Bathurst; A. E. Macaulay, corresponding secretary, St. John; G. A. B. Addy, H. A. Farris and J. R. Nugent, trustees.

Medical Societies

CANADIAN MEDICAL ASSOCIATION:—President—Dr. H. B. Small, Ottawa. President-elect—Dr. S. E. Grondin, Quebec. Acting Secretary-treasurer—Dr. J. W. Scane, 836 University Street, Montreal.

ACADEMY OF MEDICINE, TORONTO:—President—Dr. D. J. Gibb Wishart. Secretary—Dr. J. H. Elliot, 11 Spadina Road. Treasurer—Dr. J. H. McConnell.

ALBERTA MEDICAL ASSOCIATION:—President—Dr. D. G. Revell, University of Alberta, Edmonton South. Secretary-treasurer—Dr. T. H. Whitelaw, Medical Officer of Health, Edmonton.
Annual Meeting, Edmonton, 1918.

ASSOCIATION OF MEDICAL OFFICERS OF THE MILITIA:—President—Lt.-Colonel A. T. Shillington, A.M.C., Ottawa. Secretary—Captain T. H. Leggett, A.M.C., Ottawa.

ASSOCIATION OF MEDICAL OFFICERS OF NOVA SCOTIA—President—Dr. George E. DeWitt, Wolfville. Secretary—Dr. W. W. Hattie, Halifax.

BRANT COUNTY MEDICAL SOCIETY:—President—Dr. E. R. Secord, Brantford. Secretary—Dr. M. N. Faris.

BRITISH COLUMBIA MEDICAL ASSOCIATION:—President—Dr. J. Glen Campbell, Vancouver. Secretary—Dr. H. W. Riggs, Vancouver.

CALGARY MEDICAL ASSOCIATION—President—Dr. H. A. Gibson. Secretary—Dr. J. W. Richardson. Treasurer—Dr. J. V. Follett.

CANADIAN ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS:—President—Dr. J. A. Machado, Ottawa. Secretary—Dr. George D. Porter, Ottawa.

CANADIAN HOSPITAL ASSOCIATION:—President—Dr. H. A. Boyce, Belleville Secretary—Dr. J. M. E. Brown, Toronto.

CANADIAN PUBLIC HEALTH ASSOCIATION:—President—Dr. J. W. Hattie, Halifax, Nova Scotia. Secretary—Dr. J. G. Fitzgerald, University of Toronto.
Annual Meeting, Hamilton, May, 1918.

CENTRAL SOUTHERN ALBERTA MEDICAL SOCIETY:—President—Dr. J. S. Murray, Okotoks. Secretary-treasurer—Dr. G. E. Learmonth, High River.

COLCHESTER-HANTS MEDICAL SOCIETY:—President—Dr. J. W. T. Patton, Truro. Secretary—Dr. H. V. Kent, Truro.

DUFFERIN MEDICAL SOCIETY:—President—Dr. Rooney, Orangeville. Secretary—Dr. Smith, Shelburne.

EDMONTON ACADEMY OF MEDICINE:—President—Dr. C. U. Holmes. Secretary-treasurer—Dr. E. L. Garner. Library, 12 Credit Foncier Building.

ELGIN COUNTY MEDICAL ASSOCIATION:—President—Dr. F. F. McEwen, Aylmer. Secretary-treasurer—Dr. W. F. Cornett, St. Thomas.

FRASER VALLEY MEDICAL SOCIETY:—President—Dr. DeWolfe Smith. Secretary—Dr. D. F. Carswell.

GUELPH MEDICAL ASSOCIATION:—Presidsnt—A. T. Hobbs. Secretary—J. Lindsay.

HALDIMAND COUNTY MEDICAL ASSOCIATION:—President—Dr. Hopkins, Dunnville. Secretary—Dr. Courley, Cayuga, Ont.

Medical Societies—*Continued*

HALIFAX MEDICAL SOCIETY:—President—Dr. John Cameron. Secretary-treasurer—Dr. Hugh Schwartz.

HAMILTON MEDICAL SOCIETY:—President—Dr. R. Y. Parry. Corresponding Secretary—Dr. Fred Harper. Treasurer—Dr. T. W. Blanchard.

HURON MEDICAL ASSOCIATION:—President—Dr. Machell. Secretary—Dr. Hunter, Goderich, Ont.

KINGSTON AND FRONTENAC MEDICAL SOCIETY:—President—Dr. W. Gibson. Treasurer—Dr. H. E. Day, Secretary—Dr. W. T. Connell, Kingston.

LAMBTON COUNTY MEDICAL ASSOCIATION:—President—Dr. J. E. Kidd, Wyoming. Secretary-treasurer—Dr. A. R. McMillan, Sarnia.

LEEDS AND GRENVILLE MEDICAL SOCIETY:—President—Dr. J. C. Mitchell, Brockville. Secretary-treasurer—Dr. F. S. Vrooman, Brockville.

LONDON MEDICAL ASSOCIATION:—President—Dr. E. Spence. Secretary-treasurer—Dr. C. A. Harris.

LUNENBURG-QUEEN'S MEDICAL SOCIETY:—President—Dr. J. W. Smith, Liverpool. Secretary—Dr. L. T. W. Penney, Lunenburg.

MANITOBA MEDICAL ASSOCIATION:—President—Dr. Daniel G. Ross, Selkirk. Secretary—Dr. A. T. Mathers, 803 Boyd Bldg., Winnipeg. Treasurer—T. Glen Hamilton, Winnipeg.

MEDICAL OFFICERS OF HEALTH FOR COUNTIES OF LINCOLN AND WELLAND:—President—Dr. King, St. Catharines. Secretary-treasurer—Dr. Howell, Welland.

MEDICAL SOCIETY OF NOVA SCOTIA:—President—S. H. Murphy, Halifax. Secretary-treasurer—Dr. J. R. Corston, Halifax. Annual Meeting, Antigonish, 1919.

MEDICINE HAT MEDICAL SOCIETY:—President—Dr. W. H. Macdonald. Vice-President—Dr. C. E. Smyth. Secretary-treasurer—Dr. J. S. Macleod.

MIDDLESEX COUNTY MEDICAL ASSOCIATION:—President—Dr. A. S. Thompson, Strathroy, Ontario. Secretary-Treasurer—Dr. W. H. Woods, Mount Bridges, Ontario.

MONTREAL MEDICO-CHIRURGICAL SOCIETY:—President—Dr. A. E. Garrow. Acting Secretary and Treasurer—Dr. D. Grant Campbell.

MOOSE JAW MEDICAL SOCIETY:—President—Dr. J. M. Hourigan. Secretary-treasurer—Dr. J. Bloomer.

NEW BRUNSWICK MEDICAL SOCIETY:—President—Dr. G. G. Melvin, St. John. Corresponding Secretary—Dr. A. E. Macaulay, St. John. Treasurer—Dr. J. D. Lawson, St. Stephen.

NORTH-WESTERN MANITOBA MEDICAL ASSOCIATION:—President, Dr. F. A. Smith, Birtle. Secretary-treasurer—Dr. Tisdale, Kenton.

NORTH WATERLOO MEDICAL ASSOCIATION:—President—Dr. F. H. Kalbfleisch. Secretary—Dr. J. E. Hett, Kitchener. Treasurer—Dr. T. H. Callahan.

NIAGARA DISTRICT MEDICAL ASSOCIATION:—President—Dr. E. T. Kellam, Niagara Falls. Secretary—Dr. G. M. Davis, Welland.

NORTHUMBERLAND COUNTY MEDICAL SOCIETY:—President—Dr. McKenzie, Loggieville, N.S. Secretary-treasurer—Dr. Hayes, Nelson, N.S.

ONTARIO HEALTH OFFICERS' ASSOCIATION:—President—Dr. H. W. Hill. London, Ontario. Secretary—Dr. J. W. S. McCullough, Toronto.

ONTARIO MEDICAL ASSOCIATION:—President—Dr. John P. Morton, Hamilton, Treasurer—Dr. J. H. Elliott, Toronto. General Secretary—Dr. F. Arnold Clarkson. Assistant Secretary—Dr. F. C. Harrison.

OTTAWA MEDICAL SOCIETY:—President—Dr. A. T. Shillington. Secretary—Dr. J. A. Dobie. Treasurer—Dr. R. E. Valin.

Medical Societies—*Continued*

OTTAWA MEDICO-CHIRURGICAL SOCIETY:—President—Dr. A. T. Shillington, Secretary—Dr. J. A. Dobbie Treasurer—Dr. R. E. Valin.

OXFORD COUNTY MEDICAL ASSOCIATION:—President—Dr. J. M. Stevens, Woodstock. Secretary-Treasurer—Dr. G. M. Brodie, Woodstock, Ontario.

PERTH COUNTY MEDICAL ASSOCIATION:—President—Dr. A. D. Smith, Mitchell. Secretary-treasurer—Dr. F. J. R. Forster, Stratford, Ontario.

PETERBOROUGH MEDICAL SOCIETY:—President—Dr. N. D. Buchanan, Secretary—Dr. G. Stewart Cameron. Treasurer—Dr. J. Malcolm McCulloch.

PICTOU COUNTY MEDICAL ASSOCIATION:—President—Dr. C. S. Elliott, Stellarton. Secretary—Dr. John Bell, New Glasgow.

PRINCE EDWARD ISLAND MEDICAL SOCIETY:—President—Dr. G. F. Dewar, Charlottetown. Secretary—Dr. Yeo, Charlottetown. Treasurer—Dr. W. J. MacMillan, Charlottetown.

REGINA MEDICAL SOCIETY:—President—Dr. Gorrell. Secretary—Dr. Dakin.

ST. JOHN MEDICAL SOCIETY:—President—Dr. D. Malcolm. Secretary—Dr. F. P. Dunlop.

ST. THOMAS MEDICAL ASSOCIATION:—President—Dr. Alexander Turner. Secretary-treasurer—Dr. James A. Campbell.

SANITARY SERVICES OF THE PROVINCE OF QUEBEC:—President—Dr. A. Simard, Quebec. Secretary—Dr. J. A. Beaudouin, Lachine.

SASKATCHEWAN MEDICAL ASSOCIATION:—President—Dr. J. V. Cornell, Secretary—Dr. J. W. Turnbull, Regina.

SASKATCHEWAN ANTI-TUBERCULOSIS LEAGUE—President—Mr. A. B. Cook. Hon.-Secretary—Dr. M. M. Seymour, Commissioner of Health, Regina.

SASKATOON MEDICAL ASSOCIATION:—President — Dr. W. A. Cluff. Secretary—Dr. A F. Malloy.

SIMCOE COUNTY MEDICAL ASSOCIATION:—President—Dr. T. J. Johnston, Midland. Secretary-treasurer—Dr. H. T. Arnall, Barrie.

SOCIÉTÉ MÉDICALE DE MONTRÉAL:—President—M. B. G. Bourgeois, Secretary—H. M. Aubry, 323 Sherbrooke Street East, Montreal.

SOCIÉTÉ MÉDICALE DU DISTRICT D'OTTAWA:—President—Dr. M. Aubry. Secretary—Dr. M. J. E. D'Amour, Papineauville.

SOCIÉTÉ MÉDICALE DE QUÉBEC:—President—Dr. M. Savard. Secretary—Dr. M. Couillard, Quebec.

SOCIÉTÉ MÉDICALE DE TROIS-RIVIÈRES:—President—Dr. M. Deblois. Secretary—Dr. O. Darche.

SWIFT CURRENT DISTRICT MEDICAL ASSOCIATION:—President—Dr. Graham. Secretary-treasurer—Dr. Hughes.

THUNDER BAY MEDICAL SOCIETY:—President—Dr. E. B. Oliver, Fort William. Secretary-treasurer—Dr. J. G. Hunt, Port Arthur.

TWIN CITY MEDICAL ASSOCIATION:—President—Dr. W. L. Hilliard. Secretary—Dr. J. E. Hett, Berlin, Ont. Assistant Secretary—Dr. G. E. Chapman.

VALLEY MEDICAL SOCIETY:—President—Dr. M. E. Armstrong, Bridgetown. Secretary—Dr. T. M. MacKinnon, Berwick, N.S.

VANCOUVER MEDICAL ASSOCIATION:—President—Dr. J. W. Ford. Vice-President—Dr. G. B. Murphy. Secretary—Dr. A. V. Webster.

WEST ELGIN MEDICAL SOCIETY:—President—Dr. D. A. Cameron, Dutton. Secretary-treasurer—Dr. D. J. Galbraith, Dutton.

WINNIPEG MEDICAL SOCIETY:—President—Dr. J. E. Lehmann. Treasurer—Dr. A. W. Allum. Secretary—Dr. G. S. Fahani, 507 Boyd Bldg.

The Canadian
Medical Association Journal

Vol. VIII. NOVEMBER, 1918 No. 11

TREATMENT OF FOUR HUNDRED AND TWENTY INFECTED WOUNDS UNDER BATTLE CONDITIONS ARRIVING ON THE AVERAGE OF FIFTY-EIGHT AND ONE THIRD HOURS AFTER INJURY WITHOUT PREVIOUS SURGICAL TREATMENT

BY THE SURGICAL STAFF OF THE LAKESIDE UNIT

Reported by Lieutenant-Colonel G. W. Crile

Introduction

THIS is a report of a "group research" by the Lakeside Unit on the treatment of infected wounds at a base hospital during a battle. This work was made possible through the necessary authorization by General Burtschaell; the co-operation of General Bowlby; the advice of Colonel Gask and Colonel Elder; and the co-operation of the D.D.M.S., Colonel Meek. The surgical work was performed by Captains Rogers, Graham, Barney, and Brock, and Lieutenants Harrison, Jackson, Thompson, Sherry, Hinton, and Meader; the pathological work by Lieutenant Richardson.*

The Problem. In this series, the patients were on the operating table for their first surgical treatment on an average of fifty-eight and one-third hours after injury—the shortest period being twenty-four hours, and longest one hundred and fifty hours. As it developed, our problem was this: What can be done to reclaim the in-

Note.—Each Medical Officer on the surgical division of the hospital had an equal share in this work, and the results are therefore such as might reasonably be expected at any well-organized and properly-supervised base hospital in France.—J. M. Elder.

fected wounds exclusive of the head and chest and abdomen, arriving for the first surgical treatment on the fifty-eighth and one-third hour after injury? To be useful in the military sense, any plan must be limited to the equipment and personnel of a standard military hospital; it must be an everyday method; and must be adapted to battle conditions. At the fifty-eighth hour, the wound presented heat, swelling, tenderness, redness, and a discharge of purulent fluid; in this series, the wounds have been surgically untouched, undrained, not packed, but dressed and left to natural defenses up to the time of arrival.

Surgical Management

1. There were four operating tables at which
2. Two surgeons operated during eight-hour periods, leaving time for each surgeon personally to supervise the after care of his patients, to keep his records, to secure rest, and to return refreshed for his next turn at the table.
3. The daily turnover was just over one hundred operations during the acute period.
4. Every patient was examined on the table by his surgeon before anæsthesia.
5. All operations were performed on the ordinary ambulance stretcher.
6. Nurse assistants and nurse anæsthetists were employed.
7. All operative cases were prepared under anæsthesia by
   (*a*) Scrubbing thoroughly a wide field with soap and water;
   (*b*) Shaving;
   (*c*) 5 per cent. sodium carbonate;
   (*d*) Ether;
   (*e*) Alcohol.
   (Captain Barney recently introduced sodium carbonate as a supplement to soap and scrubbing.)
8. The limb and the wounds were handled with the same care during anæsthesia as before anæsthesia.
9. Every wound that had not progressed to abscess and new tissue formation was treated by complete surgical revision.
10. In large wounds, no attempt was made to excise *en bloc* within the line of uninfected tissue, but the devitalized tissue was dealt with in an opportunist manner.
11. But little skin was excised.
12. Ample exposure was always made, usually by vertical incisions.

13. After surgically meeting the indication for to-day—namely, complete revision—the "to-morrow" of the wound was considered, and certain cases were treated by

14. Incision of fascia overlying swollen muscles; incision of the skin and superficial fascia, placed where it seemed certain that within the first and second post-operative days swelling and tension would appear; that is, the operation that was anticipated as being necessary day after to-morrow was done now, but owing to these anticipatory or prophylactic incisions, little or no swelling occurred later. In other words, the surgeon aimed to take and to hold the initiative.

15. When completed, the wound was flat and soft and anticipatory—the obstacles to its biologic defence had been removed. When the wound was surgically completed, it contained many bacteria. The bacteria were facing not the normal antagonism of living tissue, but the heightened antagonism of tissue whose emergency defense had been called out by the adequate stimulus of the injury and the bacteria. The wound was in the state of a heightened defense clinically, so well known in the two-stage operation in civil surgery. There was active phagocytosis and increased blood supply everywhere; and the infecting bacteria had not gained virulence by selective struggle against antiseptics—a principle established for protozoa and recognized clinically for infection.

Having completed the revision, what shall be done with the wound, taking into account battle conditions?

We tested five plans, each applicable to rush periods, each surgeon dividing his cases among the five plans as follows:

1. Surgery, plus dry gauze dressing—no antiseptics.
2. Flavine.
3. Dichloramin-T chlorcosane.
4. Wright's hypertonic pack.
5. Alcohol.

Although recognizing the sterling merits of Carrel-Dakin, we did not use it because we were testing only those methods available for rush periods. We did not use "B.I.P." because we hoped in suitable cases to do delayed primary suturing.

General Statement and Clinical Results

1. In the period there were admitted twelve hundred and seventy-four patients.

2. Of these, six hundred and sixty were walkers, and six hundred and fourteen were stretchers.

3. Of the six hundred and fourteen stretcher cases, one hundred and ninety-four required no operation, because they were medical cases, or because the wounds were taking care of themselves, and four hundred and twenty required operation.

4. Of the four hundred and twenty operative cases, sixty-seven were marked for delayed primary suture; forty-four superficial wounds were immediately sutured.

5. Of the forty-four immediate sutures, all were successful; of the successful cases, there were two fractured humeri and one fractured radius.

6. Of the sixty-seven delayed primary sutures, 91 per cent. healed without requiring removal of any stitches; 6·1 per cent. were partial successes; 2·9 per cent. were failures.

7. Among the total number, ninety-three were compound fractures.

8. There were four, or 0·9 per cent. deaths.

9. There was no case of bacteriæmia or septicæmia.

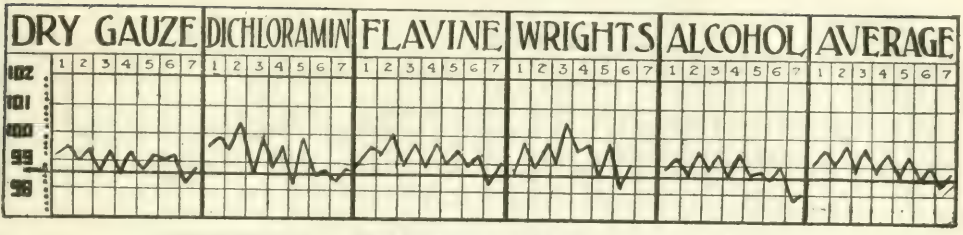
10. No case was rejected for operation because it was thought that the infection had gone too far.

11. The patients not suitable for delayed suture were quickly ready for evacuation, as seen by the chart.

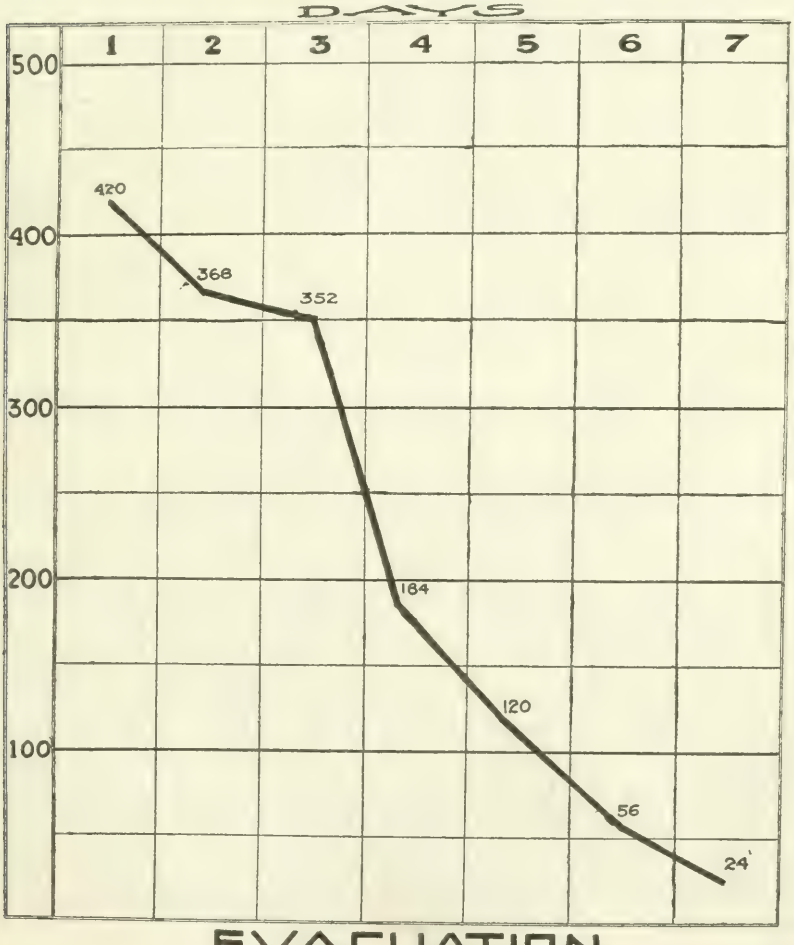
12. The comparative results in the various types of treatment are well indicated by the charts showing composite temperature curve of the cases treated by

(*a*) Plain surgery—dry gauze—no antiseptics.
(*b*) Dichloramin-T chlorcosane.
(*c*) Flavine.
(*d*) Wright's hypertonic pack.
(*e*) Alcohol.

From the foregoing it would appear that surgical revision of wounds untreated for fifty-eight and one-third hours causes no harm and does much good. It is felt that with further experience a greater percentage of delayed infected wounds including compound fractures, will be closed both primarily and delayed. The mechanism by which this benefit follows will be further discussed later; that the presence or the absence of chemical antiseptics made no notable impression on the clinical course after operation. This point will be considered further. These results are a tribute to the judgment of the surgeons in the forward area who selected the cases for evacuation without operation—and who elected to pack no gauze, insert no drainage tubes into these wounds, but merely dressed them.



COMPOSITE TEMPERATURE CHARTS
420 operations



EVACUATION
of cases operated

MECKEL'S DIVERTICULUM—REPORT OF CASES CAUSING INTESTINAL OBSTRUCTION

By Roscoe Graham, M.D.

Toronto

FITZ[1] says "The pouch-like formation of intestine occasionally seen projecting from the lower part of the ileum is universally known as Meckel's diverticulum, not that this distinguished anatomist was its discoverer, for early in the eighteenth century, Ruysch[2] presented an admirable illustration of this formation. Its frequent congenital nature was also recognized before the time of Meckel, and it seems probable that suggestions relative to its origin from the vitelline duct had been presented previous to the publication of this investigator in 1812[3]."

In order to state clearly ways in which Meckel's diverticulum may cause intestinal obstruction, a short statement of its embryology will be helpful. This process is an unobliterated portion of the omphalomesenteric or vitelline duct. In Cullen's new work on the umbilicus will be found most excellent illustrations showing the various stages in the embryonic development which should normally result in a complete obliteration of this structure.

When the gastro-intestinal tract first shows signs of development from the yolk sac, the communication is very wide. However, as the development proceeds, the entrance of the sac into the body is considerably narrowed and then becomes definitely the vitelline or the omphalomesenteric duct. The reason for the narrowing of this communication is because of the increase in size of the embryo and the amnion without any appreciable enlargement of the yolk sac; thus the latter is shoved away from the former. The structures forming the body stalk, namely, the allantois, the umbilical arteries and veins, enter the body at the same site as the vitelline duct. The two, while not fused at an early date, represent the first stage of a true umbilical cord. As the amnion and fœtus enlarge, these structures are lengthened and while outside the amniotic cavity they are separate, inside, they are held together by a sheath of amnion.

In an embryo five mm. long, the first piece of small intestine is differentiated, and from its convex border runs the vitelline duct. This communication, generally speaking, disappears when the embryo is between four and twelve mm. long. The vessels, however, persist long after this communication is cut off.

Despite the fact that this is what normally occurs, we may have various combinations of attachments and patencies of the duct. Eisendrath's[4] classification is as follows: (1) Canal persists at both ends. (2) Canal persists at both ends, the centre forming a cystome. (3) Canal persistent at the umbilicus. (4) Canal persistent at the ileum. (5) Cord attached to umbilicus and not to the ileum. (6) Cord with no lumen attached to umbilicus and ileum.

The commonest site is about twelve to twenty-four inches above the ileo-cæcal valve[5], but cases have been reported by Forester[6] in situations varying from the valve to four feet above it. The length may vary greatly, but has been placed at a minimum of ten inches. There may be a wide variation in the lumen from the size of the ileum to a lumen scarcely discernible. The specimens shown illustrate this very well, and in addition one has the unusual condition of hernial protrusions or cystic dilatation of the tip. It may or may not have a mesentery; in the latter case it derives its blood supply from the intestine.

The cases in this report show different types of diverticula, which cause obstruction.

Case 1. Where a patent diverticulum was attached only to the ileum.

Case 2. Where a patent diverticulum was attached to the ileum and to the mesentery of the ileum.

Case 3. Where a patent diverticulum was attached to the ileum and to an abdominal tumour.

Case 1. E. T., English, married, aged forty-five years, admitted to Toronto General Hospital complaining of pain in the right iliac region for eight days.

Ever since the first child was born sixteen years ago, patient has had more or less discomfort in the right iliac region. Eight days ago was suddenly seized with abdominal pain which lasted for three days accompanied by vomiting; the pain moderated after this time and left just a dull soreness slightly tender on pressure. Patient has never had any other serious illnesses. Menstruation has been regular every twenty-eight days, lasting three or four days.

On admission. Fairly healthy looking female, well developed, teeth had well marked pyorrhœa, tongue heavily coated, breath

very foul, temperature 102·2°, pulse 100. Abdomen fairly flat and lax, no visible peristalsis; on palpation a mass could be felt in the right iliac fossa the size of an orange. There was very slight increase in the muscular rigidity on the right side with some tenderness on palpation. Vaginal examination confirmed the presence of a mass, but uterus and adnexa freely moveable independent of the mass. There has been no gastric distress for six days. Urinalysis showed nothing abnormal, the white blood count was 24,000. A diagnosis of an appendiceal abscess was made and operation advised.

Operation. An incision was made over the mass, the intestines packed off and a large appendiceal abscess drained. The appendix had amputated itself about the middle, the two portions were removed and drainage established.

Progress. For the next three days the patient progressed favorably, the temperature varying between 99° and 99·4°, with the pulse around 100. There was some abdominal distension, which, however, was relieved by enemas. On the evening of the third day the distension increased and while it was possible to secure the passage of some flatus with enemas, it did not entirely relieve the condition. Later that evening the patient began to vomit and there was a slight increase in pulse rate. There was no definite tenderness except in the right iliac fossa; there was no extending abdominal rigidity that would suggest a spreading peritonitis; there was no increased elevation of temperature. The white blood count showed 12,000 leucocytes. The patient's condition became progressively more grave, but the abdominal distension never became extreme, no muscular rigidity developed, no increased elevation of temperature, no increased leucocytosis, enemas always resulting in the passage of a small amount of flatus. Operation was discussed, but as the most likely diagnosis was one of ileus paralyticus, it was considered inadvisable, particularly in view of the fact that enemas always resulted in the passage of small amounts of flatus. The pulse rate increased and the vomiting persisted, and in spite of our best efforts, the patient died a week after admission.

Post-mortem. On opening the abdomen the small intestines were found distended with no evidence of inflammation in the general peritoneal cacity. The original abscess cavity was nearly obliterated, containing about 30 c.c. of sero-saneous fluid. However, at a point eighteen inches from the ileo-cæcal valve there was a volvulus (Fig. 1) of the ileum produced by a Meckel's Diverticulum which had caused almost a complete obstruction. The illustration will explain this much better than I can describe it.

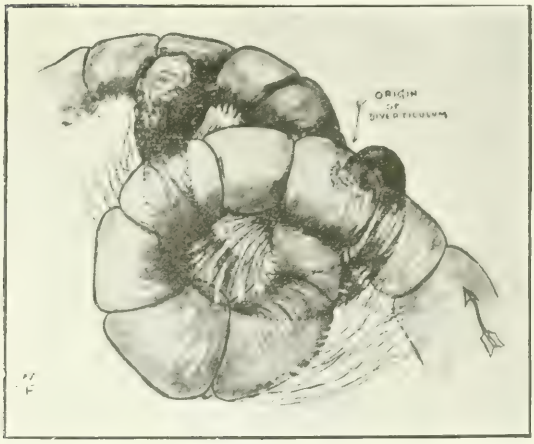


FIG. 1

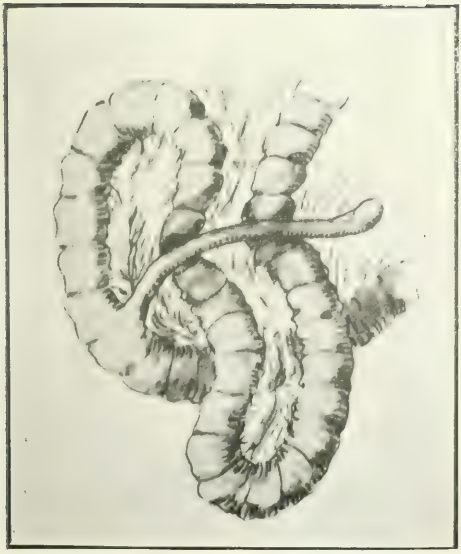


FIG. 2

FIG. 3

Case 2. Miss J. R., admitted to Toronto General Hospital, October 9th, 1916, under Dr. F. N. G. Starr, complaining of pelvic pain.

For the last two years the patient had complained of severe pain in the back, and a feeling of weight in the lower abdomen. She had never had any other severe illnesses.

She was a poorly nourished female, very anæmic, weighing about one hundred and eighteen pounds, teeth showed slight pyorrhœa.

Abdominal examination revealed nothing abnormal, vaginal examination revealed a cervical polyp and a marked retroversion. On October 10th, the patient was submitted to operation; the cervical polyp was removed, the uterus curetted, the retroversion was corrected and the appendix was removed.

The progress after the operation was uneventful for ten days, when a good deal of abdominal distension occurred. This was largely relieved by enemas. On the eleventh day the pulse rate increased and the patient was nauseated. Enemas still succeeded in expelling flatus but in successfully smaller amounts. The distension became quite severe, the nausea increased and the pulse rate reached 120. On palpating the abdomen, tense coils of small bowel could be felt, but no muscular rigidity. A tentative diagnosis of small bowel obstruction was made, and operation advised.

Operation. On opening the abdomen, tense coils of bowels presented, the sigmoid and cæcum were both collapsed. On searching, coils of small bowel were found collapsed, and on tracing them along it was seen that they herniated under a Meckel's diverticulum which was attached to the convex border of the ileum and to the superior aspect of its mesentery as shown in Fig. 2. The mesenteric attachment of the diverticulum was freed and the obstruction was relieved. The diverticulum was then amputated at the ileal attachment and the stump invaginated as in dealing with appendix stump. The abdomen was filled with normal salt solution and closed in layers. The bowels moved that evening, expelling a great deal of flatus, but the pulse became worse and the patient succumbed twenty-four hours later.

Case 3. Mrs. A. W., aged thirty-five years, referred to Dr. F. N. G. Starr by Dr. E. J. Free, of Campbellford, was admitted to the Toronto General Hospital, November 31st, 1916, complaining of abdominal swelling.

For the past few months the patient had noticed an increase in the size of the abdomen accompanied by nausea and obstinate

constipation. She had a variable appetite, was very anæmic and appeared very ill nourished. She had her appendix removed two years ago and has a ventral hernia resulting. Menses regular and normal. She has had no other serious illnesses.

On abdominal palpation a large mass was felt arising from the left iliac fossa and extending midway between the umbilicus and the ensiform; it was dull on percussion. A thrill was transmitted and it fluctuated. Per vaginam, a mass was felt filling the whole pelvis, but seemed to be more fixed on the left side. A diagnosis of ovarian cyst was made and operation advised.

Operation. On opening the abdomen, the omentum was adherent over the front of the tumour. When this was separated, the sigmoid was found to be flattened out over the left lateral aspect. The cyst arose from between the layers of the left broad ligament, thus being really retroperitoneal. In the course of separating adhesions, one came to a mass of adherent intestines from which ran a diverticulum which was attached to the cyst wall. This was severed, and when the support of its connection with the cyst wall was lost, the bowel fell into such a position as to obstruct its lumen. The cyst was completely removed and weighed twenty-three and one-quarter pounds.

The condition of the bowel was investigated and it was considered safer to resect, as acute obstruction seemed inevitable. The condition is admirably shown in Figure 3. An end to end anastomosis was made. The patient made an uninterrupted recovery.

Case 4. Master F., aged fourteen years, was seen by his physician complaining of abdominal pain, on December 3rd, 1915, and admitted to Toronto General Hospital under Dr. F. N. G. Starr.

On two previous occasions he was suddenly seized with acute abdominal pain, and each time a tentative diagnosis was made of acute appendicitis, but on the physician returning in a few hours, he was surprised to find that the pain had entirely disappeared, and the patient very well.

During this attack, however, the pain persisted and on palpating the abdomen, tense coils of intestine could be felt in the middle of the lower abdomen. There was no muscular rigidity but slight nausea. In view of the history of previous attacks and their sudden cessation, a possible diagnosis of internal hernia was suggested, possibly caused by Meckel's diverticulum, despite the fact that the case clinically simulated acute appendicitis. The curious fact, however, is that during a long rough ride in an ambulance the

patient was again suddenly and almost completely relieved of his symptoms. It was considered, however, advisable to operate.

Operation. On opening the abdomen, red and distended coils of small intestine were seen, and searching for a cause, one found a hernia under a Meckel's diverticulum, precisely as shown in Case 3, except that in this case only a small loop of bowel was herniated, the rest having reduced itself spontaneously.

Summary

1. In post-operative cases showing distension late in their convalescence, one should bear in mind the possibility of a Meckel's diverticulum being a causative factor, considering the fact that they occur in two per cent. of autopsies.

2. The palpation of tense coils of intestine as pointed out by Starr[7] is an aid in localizing the obstruction.

3. The history of no previous illness and the history of no umbilical discharge is no criterion that the patient has no diverticulum remaining.

4. If a patient after operation has had an uneventful convalescense for three days, and then develops abdominal distension, acute ileus is scarcely to be considered and some other cause must then be looked for.

5. Intestinal obstruction caused by Meckel's diverticulum seems to come on more gradually and is more intermittent than most acute obstructions.

I wish to thank Dr. F. N. G. Starr for the privilege of reporting the last three cases.

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A STUDY OF 450 CASES OF WOUNDS OF THE CHEST, WITH SPECIAL REFERENCE TO A NEW METHOD OF TREATMENT FOR INFECTED HÆMOTHORAX

By William Hutchinson

Major, Canadian Army Medical Corps

THE present war, by its magnitude and the diversity of its fighting machines, has afforded surgeons numerous opportunities of advancing their science along many lines, and of solving many problems in the diagnosis and the treatment of injuries of various parts of the body.

One of the most striking instances of this is to be found in the steady advance which has taken place in the knowledge of injuries of the thorax. The work done in this region has advanced step by step until to-day we have reached a high state of efficiency.

At the beginning of the war we were interested merely in the question of diagnosis of a hæmothorax and whether or not aspiration of the blood was worth while. Fortunately it did not take very long to settle this latter point, and so aspiration very quickly became a routine procedure. Simple aspiration was very soon followed by replacing the aspirated blood with oxygen in order to do away with the disagreeable symptoms which were sometimes produced by the rapid removal of a large quantity of blood from the pleural cavity. Thus, as far as the treatment of a simple hæmothorax was concerned, perfection was reached; but there were other and more serious problems to be solved, and it was in the solving of those the most striking advance was made during the past year.

The problems with which we were confronted were three in number, how to deal with an open pneumothorax; how to deal with an infected hæmothorax; how to deal with a foreign body in the lung. During the three years of war a great deal of work has been done on these problems, and I am glad to say they have been solved.

Etiology. The wounds of the chest, which came under my care, were produced by three types of missiles, viz.:—bullets, shrapnel balls, and pieces of shell. In my series of four hundred and fifty

cases, one hundred and twenty-seven were produced by bullets, fifty by shrapnel balls, and two hundred and seventy-three by pieces of shell. These various missiles differ both in their immediate and late effect, some of them producing more serious complications than others. Wounds produced by bullets were the least serious, those produced by pieces of shell the most serious, whilst those produced by shrapnel balls took an intermediate place.

The difference in the effects produced by these three missiles may be attributed to three causes. First, the bullet, having a tremendous penetrating power, produced small entrance and exit wounds and tended to pass directly through the chest, only a few remaining in the lung. The heat of the bullet caused a certain amount of cauterization of the track and they did not, as a rule carry in with them any foreign matter.

Second. Pieces of shell, on the other hand, tended to leave the chest open, to injure intercostal vessels; to produce large lacerations of the lung; to remain in the lung and to carry in with them all kinds of foreign material.

Third. Shrapnel-balls, on account of their size and shape, tended to injure the bony framework of the chest and remain in the lung, and because of their round smooth surface only occasionally carried in with them any foreign material.

A glance at the following tables will give an idea of the penetrating powers of the different projectiles and their tendency to produce infection of the hæmothorax.

Shell		Bullet		Shrapnel Ball		
Retained	Not retained	Retained	Not retained	Retained	Not retained	Total
164 36·4%	109 24·2%	18 4%	109 24·2%	22 48·%	28 6·2%	450

INFECTED

Shell		Bullet		Shrapnel Ball		
Retained	Not retained	Retained	Not retained	Retained	Not retained	Total
37 45·6%	18 22·2%	4 4·9%	13 16·04%	6 7·4%	3 3·7%	81

Pathology. The pathology of wounds of the chest comprises the pathology of the various parts of the thorax. When the missile hits the chest, various effects may be produced on the chest wall. If the foreign body is very large and strikes the chest with its flat surface, the result may be simple bruising of the soft tissues with or without fracture of the ribs. If, however, the foreign body hits the chest wall edgewise, it may carry away a large portion of the soft tissue and very often portions of one or more tibs. When this occurs, the intercostal vessels are usually injured, causing a profuse hæmorrhage both into the chest and outwards through the wound. If, on the other hand, the foreign body is quite small, it will usually penetrate the chest wall, leaving a small opening which becomes immediately sealed off.

The next part affected from within outwards is the pleura, and the potential cavity lined by this membrane. When a large laceration of the soft tissues occurs with comminution of the ribs, the pleura is usually torn and the potential cavity at once becomes a definite space due to the collapse of the lung. Into this space air rushes and later on a quantity of blood collects in the cavity.

If the wound in the pleura is made by a small penetrating object, the quantity of air which enters is usually small and quickly becomes absorbed, the cavity being filled with blood. Occasionally when such a wound occurs no air enters and there are cases in which a hæmothorax does not develop. A few cases have come under my observation in which a bullet had passed directly through the chest and in which it was not possible to discover any blood in the pleural cavity. In the majority of cases the air is very quickly absorbed and by the time the patient reaches the Base Hospital, it cannot be demonstrated.

In my whole series there were only three cases of pneumo-hæmothorax other than those in which gas developed as the result of infection. Colonel Bradford saw only four cases in a series of three hundred and sixty-five wounds of the chest. Occasionally a valvular pneumothorax develops either as the result of a valvular opening having been made in the chest wall or in the lung. These two conditions must not be confused as the treatment is directly opposed. In the case of a valvular opening in the chest wall, closure of the wound will cure the condition, whereas in the case in which a valvular opening has been made in the lung, closure of the chest wound would be fatal. A case illustrating the latter condition came under my observation. Here the foreign body had entered the chest wall from behind, passed through the lung

and axilla and lodged in the upper arm. At the Casualty Clearing Station the wound in the back had been closed and the pneumothorax subsequently increased with subcutaneous emphysema of the axilla, chest wall, and arm. The patient died shortly after admission to hospital, and at autopsy a valvular opening was found in the lung. By the action of this valve, air was forced into the pleural cavity and as the wound in the chest wall had been closed, it had no means of escape.

When a pneumothorax exists there is usually found to be a negative pressure in the pleural cavity, but in one of my cases a distinct positive pressure was discovered. In this case there was a slight leak of air from the wound in the lung, as the pneumothorax recurred after every aspiration and eventually a resection of a piece of rib had to be done on account of infection. This is probably the explanation of all those cases of pneumothorax in which a positive pressure is discovered.

The blood which collects in the pleural cavity as the result of wounds of the chest is a subject of much interest. The quantity of blood which collects in the cavity depends on the amount of injury done to the lung and possibly to the portion of the lung injured. As a rule, bullet wounds through the upper part of the lung do not produce as large hæmothorax as those through the lower part. This view, however, is not universally held, but in my experience it was the case.

The source of the blood is usually the lung, but occasionally it may come from a wounded intercostal vessel. In my series only one case showed it to be definitely due to a wounded intercostal vessel.

The character of the blood varies a great deal; in some cases it is thin, bright red in colour and does not contain any apparent clot, whilst in other cases it is very thick, almost black, and contains a large amount of clot. A great deal of work has been done on this blood by Elliott and Henry, and they have come to the conclusion that the blood is defibrinated in all cases, the fibrin being deposited on the pleural surfaces. However, no satisfactory explanation has been given as to why in some cases no clot is found in the fluid, whereas in other cases such a large amount of clot is present. When the fluid blood is withdrawn, clotting does not take place in the bottle, thus showing that fibrinogen does not exist in it. On examination it will be found to contain red-blood cells, endothelial cells, lymphocytes and an occasional polymorphonuclear leucocyte.

Colonel Rudolph, however, reported one case in which clotting did occur in the test tube. This may have been due to the presence of infection which produced an outpouring of serum into the hæmothorax. In one of my cases in which infection by a non-hæmolytic streptococcus occurred clotting took place in the aspirated fluid, but the clot was not a blood but a serum clot as the result of reactionary serum poured out. This was the only case in my series in which clotting occurred in the bottle.

In a certain number of cases in which a foreign body has entered the chest, serum and not blood will be found in the pleural cavity, and in some cases the fluid is distinctly purulent. Out of four hundred and fifty cases serum was found in twenty-two and pus in five. Two of these pus cases contained bacteria.

When infection occurs in a hæmothorax the amount of fluid increases as the result of inflammatory serum being poured out. Contrary to expectation, the blood in these cases is not usually thin, but dark and thick, consequently I have come to look upon this condition as a sign of infection. At times the blood has a disagreeable odour, particularly in those cases in which the bacillus ærogenes capsulatus is present. On microscopic examination, the blood will be seen to contain quite a large percentage of polymorphonuclear leucocytes, the number depending on the length of time and character of the infection.

When the blood is infected with the bacillus ærogenes capsulatus, gas develops in the pleural cavity and the clot, of which there is usually a large quantity, has a spongy appearance.

There is always a certain amount of fibrin deposited on the pleural surfaces, and when infection takes place this fibrin is permeated with leucocytes and converted into a pyogenic membrane. Various bacteria have been found to be the cause of the infection, and a glance at the following table will show the bacteria found in my series and the frequency with which they occurred.

Infected Cases—81

B. Ærogenes Cap.....	21	=	25·9 per cent.
Streptococcus.....	26	=	32·9 "
Staphylococcus.....	3	=	3·7 "
Pneumococcus.....	12	=	19·8 "
Diplobacillus.....	1	=	1·2 "
Mixed infection.....	18	=	22·2 "

The examinations of the statistics of other surgeons show

approximately the same percentages, although some report a higher percentage of gas infection.

Lung. When a missile hits the chest without causing a wound, collapse of the lung may occur with extravasation of blood into the collapsed area and at times this area becomes adherent to the chest wall. If the foreign body fractures a rib, a laceration of the lung may be caused.

When a foreign body enters the chest, it may bruise the lung, tear it, pass directly through it or remain in its substance. In cases in which laceration of the lung is produced, collapse occurs in the vicinity of the tear, and blood is at once poured out into the track and surrounding lung tissue for a variable distance. The collapse of the lung and the clotting of the blood about the track arrest the hæmorrhage.

Very quickly inflammatory cells collect in the lung about the injury, thus completing the consolidation.

When the foreign body is retained in the lung, it is quickly surrounded by collapsed lung, blood clot and inflammatory tissue, thereby shutting it and any infective material carried in by it, off from the pleural cavity and leaving the lung to deal with any infection, which it can do admirably.

This is shown by the fact that very few cases requiring surgical interference have been met with. Colonel Rudolph, after examining a large number of cases in England, found only four with abscess of the lung. In only one of my cases did the foreign body in the lung do any serious damage.

I do not agree with the French writers who claim that in the majority of cases the hæmothorax becomes infected from the foreign body, or its track in the lung. I am quite convinced that infection is carried into the pleural cavity at the time of injury but lies dormant in the blood clot of the hæmothorax and gradually breaks through into the general hæmothorax.

I have had cases in which the bacteria were found in the clot and not in the fluid blood.

Collapse of the lung occurs in the vicinity of the injury in all cases but also at times it occurs in the lung at quite a distance from the central site of the injury and occasionally it occurs in the opposite lung.

No satisfactory explanation has been offered for this condition. Compensatory emphysema develops in the lung above the small area of compressed lung found directly above the fluid.

Pathological changes very often occur in the opposite side of

the chest, as for instance a small amount of serous fluid is often found at the base and occasionally this has gone on to empyema, which is always the result of pneumonia or an infected hæmothorax. Pneumonia occasionally develops in the lung of the opposite side and probably starts in the area of collapse. I have never seen a true lobar pneumonia but I cannot agree with Colonel Bradford when he says that pneumonic consolidation does not occur beneath a hæmothorax. In one of my cases in which the hæmothorax was infected with the pneumococcus the whole lower lobe was a mass of consolidation.

I have seen a number of cases in which the clinical signs pointed to inflammatory consolidation of a large amount of lung in the vicinity of the foreign body.

Broncho-pneumonia occasionally occurs and is usually fatal.

There is one other condition which has been met with, that is massive collapse of the lung. It comes on some time after the injury, appearing quite suddenly and produces very severe dyspnœa and cyanosis but passes off fairly quickly. It has never been known to go on to a fatal termination although it is very alarming at the time.

Pericardium. The pericardium may be injured by the missile or may become inflamed as the result of infection of the hæmo thorax. A few cases of hæmopericardium have been seen and occasionally serous effusion into the pericardium has developed. Infection of the pericardium with a resulting purulent percarditis is fortunately rather a rare occurrence considering the number of cases of infected hæmothorax. Apparently infection does not travel easily through the pericardium, as I have had cases in which a pocket of pus was found between the lung and pericardium and yet there was no infection inside this cavity. In my whole series there were only three cases of purulent pericarditis.

Great vessels. Occasionally the foreign body in entering or passing through the chest injures one of the great vessels. Two cases came under my care in which there was an aneurism of the innominate artery one of these being an arterio-venous aneurism.

Liver. The liver is sometimes injured by the foreign body as it passes through the right chest.

Bradford and Elliott have reported cases in which bile was recovered from the pleural cavity as the result of injury to the liver which communicated through the diaphragm with the pleura.

Diagnosis. The question of diagnosis of wounds of the chest really comprises the diagnosis of conditions produced in the lung

and pleural cavity by the foreign body and must be considered under the headings of "simple hæmothorax"; "largely clotted hæmothorax"; "pneumothroax"; "infected hæmothorax"; and "infected lung".

As to the diagnosis of *simple hæmothorax*, it is only necessary to mention one or two interesting points as the signs of fluid in the pleural cavity are so thoroughly well known. The level of the fluid can usually be determined by the presence of blowing breathing, œgophony and increased tactile fremitus immediately above where the signs of fluid are found. The signs found in those cases in which the hæmothorax is very large and compresses the lung down to its hilus are of interest, as they have a practical bearing on the treatment of the non-infected hæmothorax. In the first place it will be noticed that the heart is very much displaced to the opposite side and at times a pleuro-pericardial friction can be made out between the pericardium and the pleura on the uninjured side. On percussion, the whole of the injured side of the chest is found to give a flat note which at the back extends for a short distance on the opposite side of the spinal column. Tactile fremitus will be absent but the breath sounds will be blowing in character and œgophony and whispering pectoriloquy will be present.

The explanation of these signs is found in the fact that the whole lung is compressed down to its hilus and the chest, being tense, allows the bronchial sounds to be transmitted.

The next condition which is practically the same as the one already described, but has been separated from it on account of its growing importance from the standpoint of treatment, is that of a *largely clotted hæmothorax*

In this condition, although the heart may be somewhat displaced to the opposite side, the flat area does not extend all over the injured side, but there is blowing breathing, œgophony, and whispering pectoriloquy over the whole of this flat area.

Personally, as the result of examination of a large number of cases, I am convinced that these signs point invariably to the presence of a large amount of clot in the pleural cavity. Then again if a trocar is inserted in several places and little or no blood obtained, one has additional proof that the blood is clotted.

In respect to the diagnosis of *pneumothorax*, there is nothing new to add to our previous knowledge of this condition.

We now come to the diagnosis of the most serious complication of chest wounds met with at the Base Hospital, that of an *infected hæmothorax*. The importance and seriousness of this condition is

shown by the fact that in my series of four hundred and fifty cases, eighty-one of them became infected, and of this eighty-one, fourteen died.

Bradford and Elliott found one hundred and seventeen cases in four hundred and fifty, and if the general statistics be taken, it will be found that about 25 per cent. become infected.

The diagnosis of infection in a hæmothorax must be made as early as possible if the mortality is to be kept low, and this can only be done if special attention is given to patients with chest wounds. These cases should be segregated in special wards where medical officers and nursing sisters will take particular interest in such patients. In this way the whole staff will be on the alert, and proper charts recording the temperature, pulse, and respirations, at least four times a day will be kept. I cannot emphasize too strongly the importance of proper charts as they give the earliest indication of infection, and if this be done, there is no reason why patients should show that advanced sign of infection, namely, jaundice.

Providing a diagnosis of hæmothorax has been made, as soon as the temperature, pulse, and respirations begin to rise together, an infection should be suspected and aspiration of the blood done at once. In many cases of infection the blood will be dark in colour, rather thick, and will contain tiny pieces of black clot. Sometimes the blood will have a foul odour, and when present, this is quite diagnostic of infection. As soon as the blood is withdrawn, it should be sent to the bacteriologist for examination, and a report obtained as to whether or not infection is present, and, if present, as to the special organism found. There is one point in the bacteriological examination of this aspirated blood which is of extreme importance, and that is the careful search for tiny pieces of clot, as it will often be found that they contain bacteria when none have been found in smears from the fluid.

The examïnation should consist not only in examining the smears but also in planting the blood on ærobic and anærobic media. If the presence of infection cannot be determined at the first examination, and the patient's condition does not improve, another aspiration must be done, and so on until either an infection has been demonstrated or the patient's condition has improved. In the majority of cases, infection will be found on the first examination and only occasionally will a second or third aspiration be necessary.

The next important condition, and one which requires much care in diagnosis, is a *wounded lung with consolidation and infection*

in its substance. These cases always have a certain amount of blood in the pleural cavity and it is not possible by physical signs alone to differentiate in the majority of cases between an infected hæmothorax with compressed lung and a hæmothorax with infected and consolidated lung. It is in these cases the greatest care is required in making a differential diagnosis as the methods of treatment in the two conditions are directly opposed to one another the former requiring active and immediate surgical interference, whereas in the latter case surgical interference would do a great deal of damage.

The differential diagnosis can usually be made by carefully considering the chart. In the case of an infected hæmothorax, the temperature, pulse, and respirations rise together, while in the case of an infected lung the temperature is usually high, the pulse rate only slightly increased and the respirations remain in the vicinity of 28 or 30. Although this is the rule, and the majority of cases come under this rule, yet as there are exceptions to all rules, an exploratory aspiration must be done and a bacteriological examination of the fluid made.

Treatment. In dealing with the treatment of wounds of the chest, they must be divided into four classes:

1st. A non-infected hæmo or pneumo-hæmothorax.
2nd. An open pneumothorax.
3rd. An infected hæmothorax.
4th. A foreign body in the lung or pleural cavity.

The treatment of a simple non-infected hæmothorax, or a pneumo-hæmothorax, consists in merely aspirating the blood from the pleural cavity. This should be carried out in all cases in which more than two fingers breadth of dulness can be made out. In my series of four hundred and fifty cases, three hundred and sixty-eight were aspirated, the remainder not having sufficient fluid to warrant it. The aspiration is done by means of the ordinary aspirating apparatus with which everyone is familiar, but there are one or two practical points which I should like to mention, as they will, if carried out, make the procedure easier both for the patient and for the surgeon. A local anæsthetic should be injected into the skin, muscles, and pleura in order to make the aspiration as painless as possible. After the injection of the anæsthetic, a tiny incision should be made through the skin so that the round canula will not be gripped by it. In the next place it is important to use a fair sized trocar, as small needles are very easily blocked, and another advantage in using a trocar is that when the sharp obturator is

removed, the blunt canula can be moved about the pleural cavity without damaging the lung. If during the aspiration the patient begins to suffer pain in the chest and shortness of breath, the trocar can be disconnected from the bottle and a little air allowed to enter the pleural cavity, and it will then be found that more blood can be withdrawn before the pain and distress return. In commencing to aspirate a chest, especially in cases where a quantity of air is present in the pleural cavity, the bottle should not be exhausted before the trocar is connected, but should be exhausted gradually during the whole aspiration as the sudden evacuation of air when the tap is opened might cause alarming symptoms.

A number of surgeons prefer oxygen replacement in these cases.

The treatment of non-infected hæmothorax in which there is a large amount of blood clot requires special mention as there is a difference of opinion as to the course to be pursued. Personally I believe the chest should be opened, all the blood and clot removed, the pleural cavity closed, and the air aspirated. I would also recommend that this be done as early as the patient's condition will permit, as then the lung will get a chance to expand before adhesions form. There are two reasons why this should be done: 1st. The removal of blood and clot by aspiration is impossible and therefore we must depend upon absorption to remove them, and as this is necessarily a slow process the lung remains compressed for a long time and adhesions between the compressed lung and the chest wall become firm. 2nd. These cases in my experience formed the great bulk of the infected ones, and I am sure that had they been treated by operation in the first place they would have escaped infection.

The treatment of an open pneumothorax has been greatly improved during the past year and the results obtained at the Casualty Clearing Hospitals are very encouraging. In this condition it is important to clean the wound thoroughly to wash out the pleural cavity with saline and to close the chest completely. This should be done early as the condition of shock will be relieved by the closure and also the danger of infection will be decreased. If the patient's condition will stand it, and the foreign body is fairly accessible, it should be removed. If there seems a likelihood of infection having taken place, then three ounces of 1–5000 flavine solution should be left in the pleural cavity and the usual after treatment of an infected hæmothorax carried out.

We now come to the treatment of the most serious complication of chest wounds with which we have to deal at the Base in France, *i.e.*, a hæmothorax which has become infected. While

doing surgical work in France during 1915–16, I was impressed by the great improvement in the results obtained by the cleaning out and closing of knee joints which had become infected by wounds, over the results obtained by the old method of drainage, and in reviewing the good results obtained by closing the peritoneum in cases of general peritonitis, I came to the conclusion that if the lining membrane of the knee joint and the peritoneal lining of the abdominal cavity could look after a considerable amount of infection, the pleura ought to be able to do the same. I therefore decided to apply this principle to the treatment of an infected hæmothorax, and so in the beginning of 1917 I initiated the line of treatment which I shall describe below. Before describing operative technique, I wish to say one word against palliative measures in these cases. Simple aspiration in infected cases is of no avail, as in the first place it is impossible to remove all the blood from the chest by this means and in the second place the clot in which lies the focus of infection cannot possibly be removed through a trocar. Then again it is impossible to sterilize the clot by any known antiseptic which can be used in the pleural cavity, and therefore the only possible means of treating these infected cases is by operation.

Lately Lockwood suggested that an attempt should be made to treat these cases by aspiration, basing his views on some post-operative cases which had become infected. These cases, however, differ entirely from an infected hæmothorax, as they only contain infected serum and no blood clot.

In cases of infected hæmothorax, valuable time is wasted by such attempts, but I agree with him that cases that have been cleaned out and closed should not be drained until aspiration has been given a thorough trial.

The method to be applied in these cases is as follows. As soon as the hæmothorax is found to be infected, by that I mean clinically and bacteriologically (not merely bacteriologically), the patient is taken to the operating-room and placed in a partially sitting position on the table. He is then turned a little towards the good side so that the post axillary line is brought well into view. The best anæsthetic to use in these cases is nitrous oxide and oxygen, which in the hands of a good anæsthetist* produces perfect anæsthesia. If the patient is in a very bad condition, I use a local anæsthetic up to the time of resecting the rib and then a general anæsthetic. I found that the patients came off the table in a

*The anæsthetic in all my cases was very carefully and scientifically administered by Nursing Sister Nicholson, C.A.M.C.

better condition than when they went on, and that there was no post-operative collapse, which I attribute to the use of oxygen. Chloroform and ether should never be administered to these cases, but if nitrous oxide is not available and one of these has to be used, then oxygen should be given at intervals during the operation and at the end of it. A portion of rib, long enough to allow the hand to be passed through the opening, should be removed and the blood allowed to flow out. The clot is then removed by the hand, all parts of the cavity explored and light adhesions broken down. Then by means of large pieces of gauze on dressing forceps, the remainder of blood and clot is removed. After this, the cavity should be washed out with saline and again mopped out and a running suture inserted in such a way as to include the pleura and intercostal muscles. This suture should be left quite loose so that a small quantity of some antiseptic can be poured into the pleural cavity. This antiseptic should be spread all over the walls of the cavity by means of a small piece of gauze on long dressing forceps. As soon as this has been done, the running suture is drawn tight, thus closing the pleural cavity completely. The muscles and skin are then closed and a dry dressing applied.

Forty-eight hours after the operation, the chest should be aspirated, thus removing a quantity of serum and air. This is done for two reasons, first, the serum by that time has lost its bactericidal properties and then only becomes a menace, and secondly, by removing a good deal of the air from the pleural cavity, all negative pressure is obtained which helps to re-expand the lung. It will be found that three or four aspirations are necessary during the course of convalescence

The antiseptics which I have used in these cases include eusol solution $\frac{1}{2}$, a suspension of B.I.P in liquid paraffin in the following proportions, B.I.P $\frac{1}{2}$ oz., liquid paraffin 6 oz., flavine solution 1-5000 and normal saline, the amount left in the chest being 3 oz. The results from twenty-nine cases treated in this manner are as follows:—

Eusol		B. I. P.		Flavine		Saline	
Remained closed	Re-opened	Remained closed	Re-opened	Remained closed	Re-opened	Remained closed	Re-opened
2	5	11	4	2	3	1	1

Total—Remained closed, 16; reopened, 13.

When considering this method of treatment, the question naturally arises as to which cases should be treated in this way. In answer to this I may say that at the present time I am inclined to close every case, and if the patient shows signs of becoming worse after the first post-operative aspiration then it will be time enough to drain.

There are, however, certain types of infection which lend themselves to this form of treatment better than others, as an examination of the following table will show:—

	Remained closed	Reopened
B. Aerog. Cap.	11	3
Streptococcus.	1	6
Staphylococcus.	1	0
Pneumococcus.	1	2
Diplobacillus.	1	0
Mixed Infection.	1	2

There is one point in the technique of the treatment by drainage which I wish to po nt out and that is that the constant washing of the pleural cavity in early cases is harmful. In place of this washing process the occasional filling of the cavity with a eusol solution 1-3 and good grainage should be substituted. In this way the body is stimulated to pour out serum into the cavity which washes the pyogenic membrane from within outwards instead of merely washing its outer surface. In order to do this, the patient is placed on his good side, so that the opening of the chest wall will be the highest point. A one-third solution of eusol is then allowed to flow gently into the cavity until it is filled, and then the patient is turned over and the fluid allowed to run out. This is repeated every second or third day, depending on the condition of the patient.

The last question with which we have to deal is that of the treatment of the foreign body which has been retained in the lung. It is over this question that a great deal of controversy has taken place during the past three years. I have had the opportunity of treating a large number of cases and have talked to a number of surgeons and physicians, and as the result of my own experience and that of others, I have come to the conclusion that the question must be decided separately in three types of hospitals: the Casualty

Clearing hospital, the Base hospital in France and the Base hospital in England; and that a surgeon in one area is not in a position to dictate to a surgeon in any other area. The French surgeons, generally, advocate the removal of all foreign bodies from the lung, large ones at the Casualty C earing Stations and smaller ones later. The English surgeons are much more conservative and only advocate the removal of large foreign bodies at the Casualty Clearing Hospitals. As all my work has been done in a base hospital in France, I am only in a position to discuss the treatment which should be carried out in cases with retained foreign bodies in the lung during the interval from the time they leave the Casualty Clearing Hospital to the time they arrive in England.

As a result of an experience with four hundred and fifty cases, and from reports received from other surgeons similarly situated, I am convinced that no attempt should be made to remove the foreign body from the lung while the patient is in a Base Hospital in France.

Colonel Rudolph investigated a number of cases of th s nature in England and only found four in which the foreign body gave serious trouble. Colonel Elliott investigated one hundred and seventy cases in England and found only one fatal case, which case had had an operation for the removal of the foreign body.

Results

In my series of four hundred and fifty cases, there were twenty-seven deaths, the causes of which when examined, will show the hopelessness of certain cases and will also point to one problem in surgery which has not been solved, that is, cases in which the infected hæmothorax is pocketed. In these twenty-seven cases the causes of death were as follows:—

1. Septicæmia, due to pocketing.....drained.
2. Septicæmia .....drained.
3. Septicæmia.....drained.
4. Abscess of Lung.....drained
5. Pneumonia and empyema (opposite side) hæmothorax .....drained.
6. Gangrene of lung.....drained.
7. Septicæmia.....drained.
8. Septicæmia.....drained.
9. Moribund, time of operation.....drained.
10. Septicæmia, due to pocketing.....closed and reopened.

11. Septicæmia, due to pocketing.....closed and reopened.
12. Septicæmia, due to pocketing.....closed and reopened.
13. Pyæmic abscesses (both lungs).....closed and reopened.
14. Pneumonia and empyema (opposite side), hæmothorax.....closed and reopened.
15. Acute gas gangrene of chest wall.....closed and reopened.
16. Septicæmia.....closed and reopened.
17. Septicæmia.....closed and reopened.
18. Gas grangrene of chest wall.....closed and reopened.
19. Double pneumonia.....no operation.
20. Broncho-pneumonia and tuberculosis.....no operation.
21. Septicæmia.....no operation.
22. Gas gangrene (one side), pneumonia and empyema (opposite side).....no operation.
23. Streptococcus (arm) mediastinitis, abscess of lung.....no operation.
24. Pneumonia (opposite side).....no operation.
25. Double broncho-pneumonia.....no operation.
26. Secondary pulmonary hæmorrhage, infected hæmothorax.....drained.
27. Died on table before operation.

Conclusions

1. All cases of wounds of the chest should be treated in special wards or special hospitals.

2. Careful charts should be kept which record temperature, pulse, and respirations four times a day.

3. Early diagnosis of infection is important.

4. Every case in which there is more than two fingers' breadth of dulness should be aspirated.

5. Cases of open pneumothorax should be closed as early as possible.

6. Cases in which there is a large amount of clot in the chest should be opened, blood and clot evacuated and the chest closed. This should be done as early as possible.

7. Cases in which the hæmothorax is found to be infected should be opened, washed out and closed; some antiseptic being left in, preferably an emulsion of B.I.P. in liquid paraffin.

8. Post-operative aspirations must be done in all closed cases, the first forty-eight hours after operation.

9. No attempt should be made at the Base Hospital in France to remove a foreign body from the lung.

MOUTH INFECTION AS A SOURCE OF SYSTEMIC DISEASE

B. A. Murray, D.D.S.

HISTORICAL.—More than twenty-five years ago, it was pointed out by W. D. Miller that oral sepsis was the prime factor in the causation of certain constitutional disturbances.

In 1900, Dr. William Hunter, of London, England, published an article in the London *Lancet*, in which he suggested that it could not be a mere coincidence that certain constitutional conditions occurred in patients with septic mouths. In 1901, he further elaborates on this subject, but not until 1911 was he able to thoroughly awaken the medical and dental professions to a realization of their responsibilities to the public in reference to septic mouths. His attack on the American dentists was vehement, but had the desired effect, although for a time it created no little antagonism, due to the fact that he failed to differentiate between the scientific dentist and the charlatan. Then, too, Dr. Hunter was pleased to take unto himself the responsibility of determining what teeth should be sacrificed, and what ones should be retained, as well as to suggest the class of artificial substitutes.

To quote Dr. Hunter: "For the past twelve years, in connection with various studies, my attention has been called to an increasing degree, to an important prevalent source of disease, one whose importance I think is not sufficiently recognized. The source is oral sepsis—sepsis arising in connection with diseases of the mouth. My attention," he says, "was first drawn to it in connection with the pathology of anæmia, and since then has been extended in connection with the pathology of a great number of infective diseases, which have one factor in common, viz.: septic organisms underlying them."

To-day, no less than twenty odd diseases can be traced to these same septic organisms, and the physician who is not cognizant of the influence of these micro-organisms, as manifested by their effect on the system, is considered a back number. On the other hand, the physician who is wide awake to the discovery and the elimination of these septic foci wherever found, is a benefactor to

the people whom he serves, as well as being likely to be in a position to serve the greatest number.

The time has come when a patient presents himself to a physician, with one or more of the many diseases such as anæmia, arthritis, rheumatism, endocarditis, gastro-enteritis, nephritis, diabetes, etc., or even certain eye and ear conditions. The physician, knowing his limitations, calls in to consultation, the stomatologist, the rhinologist, the gynæcologist, and the genito-urinary specialist. Together they make a thorough search for primary septic foci, the discovery and removal of which will in all probability aid materially in clearing up the pathological lesions as manifested in the individual case.

It is generally conceded, that within the alimentary and respiratory tracts are found a large percentage of the primary septic foci, from which by means of the circulating blood, these microorganisms are carried to all parts of the body. Billings makes the claim that systemic disease due to a focus of infection anywhere, is probably always hæmotogenous, and histologically there is found embolism of the small and terminal blood vessels. Local hæmorrhage and endarterial proliferation result in interstitial overgrowth, cartilaginous, osseous, vegetative, and other morbid anatomical changes depending upon the character of the tissues infected. In other words, a chronic abscess tooth may cause systemic disease, by hæmatogenous bacterial emboli, which infect and at the same time deprive tissues of nourishment.

It was formerly thought that the staphylococcus was the bacterium accountable for these diseases, but more recent study has proven, that the blame lies chiefly with the streptococcus pneumococcus group, more particularly the streptococcus viridans. It is worthy of note that this particular bacterium is always found in connection with pyorrhea alveolaris and chronic alveolar abscess.

Drs. Rosenow, Billings and Gilmer, of Chicago, have since made exhaustive study of the conditions as found in the oral cavity, some of which are worthy of being brought to your attention.

Dr. Rosenow says: "One striking thing in connection with some of the most chronic infections, is that the character of the bacteria found in the lesion may be quite different from the character of those found in the focus of infection at the same time. This, however, does not minimize the importance of the focus of infection in any way, for the organism found in the tissues may have undergone a change. This change seems to be due to the effect of the varying degrees of oxygen tension on the members of the streptococcus group."

It has been my purpose to briefly draw a mental picture of the possibilities of primary septic foci as found in any location of the body, from possibly the cutaneous surface of the great toe, or possibly from the urethra of the male, as manifested by some low form of inflammation, or possibly from a chronically affected tonsil, but more than likely from one or more of the fifty-two roots of the teeth, for it would seem to me, that in the ratio of the number of roots of the teeth, is the ratio of the possibilities of the septic foci. For certainly no part of the anatomy presents greater difficulties for the exercise of prophylaxis than does the oral cavity. With your permission, I shall endeavour to briefly outline the conditions as found in a large percentage of the mouths of the patients sent to the dental surgeon by his medical friends, with a view to the discovery and treatment of all oral septic infections, hoping thereby to be of aid in the fight against the ravages of some particular disease or diseases. A superficial examination is usually all that is necessary to prove the necessity for a thorough "house-cleaning" in order to make a more careful examination possible. This superficial sterilization being completed, the mouth is now ready for a more careful examination to determine what teeth and roots should best be extracted, as well as the best manner for treating remaining teeth.

Extraction of these septic teeth should be the last resort, for the teeth are valuable organs, and should not be ruthlessly sacrificed; yet the health and life of the individual are worth more than many teeth. When the value of a tooth is weighed against the health of the individual, there is no question about which shall be sacrificed. Your essayist knows of no circumstances under which the exercise of good judgement and wise conservatism are of greater value to the patient than in cases of this character. If, in the judgement of the operator, it is best to retain certain devitalized teeth, the roots of each should be carefully radiographed with a view to discovering blind abscesses or other focal infections. Next, with a properly shaped explorer, search should be made for pyorrheal pockets, areas of carious or necrosed bone, together with all forms of inflammation as found about gingival margins, about ill-constructed crowns, bridges, and plates, together with all other pathological lesions within a given month. At this point a word of caution might not be amiss, this caution to be exercised in all mouths under observation, and that is for the stomatologist to be on the eternal alert for evidence of syphilis, for oral manifestations of this disease are much more common than is generally thought by the average dental surgeon.

A complete history is thereby obtained and report is made to the physician sending the case, and from that time on it is only necessary for careful co-operation of physician, dental surgeon, and patient, until a satisfactory recovery is made; whereas, without this team-work, recognition of and successful treatment would be well-nigh impossible.

The following three cases from my own practice are illustrative of the opportunities which the stomatologist may have for assisting the internist:

Case 1. Mrs. A. J. S., age forty-five, came to my office accompanied by her physician and nurse, suffering from pernicious anæmia, had been confined to her bed for much of the time covering a period of months. An examination of her mouth disclosed the fact that a number of her teeth were fairly floating in pus, others showed evidence of alveolar abscess at apices of roots. Five of the worst of these teeth were extracted, the remainder treated for pyorrhea or abscess until all evidence of pus had cleared up, and teeth became tight in their sockets; this took upward of two months' time. The patient showed evidence of improvement within a month of the extraction of the first teeth, and within six months was doing the most of her house-work, having dismissed both nurse and maid. After two years, no evidence of relapse.

Case 2. Mrs. E. P., aged forty, suffering from arthritis, more particularly of the joints of the fingers; it was with difficulty that she could open and close her hands. An examination of the mouth disclosed the fact that all of her teeth were affected with pyorrhea; in addition, two or three had chronic alveolar abscesses without fistulous openings. Surgical amputation of individual affected roots of multi-rooted teeth and surgical treatment of pyorrheal teeth effected a cure. Within three months all evidence of arthritis had disappeared. Four years have elapsed without any return.

Case 3. Mr. B. presented with a case of antral engorgement, effected by abscess about the mesio-buccal root of upper left second molar. Case readily responded to treatment, clearing up a bad case of rheumatism.

Summary

The primary pus focus is the predominating etiologic factor in the production of a large number of diseases.

Systemic diseases due to a focus of infection anywhere are probably always hæmatogenous.

Partial or complete ischæmia of the tissues due to embolism is an important factor in the production of the morbid anatomic changes.

Early recognition of focal infection associated with septic teeth will often prevent the establishment of many serious local and general disorders.

The mouth is likely to be the greatest nidus for the growth and development of micro-organisms.

To a considerable degree the elimination of these oral pus foci can be brought about without wholesale extraction on the part of the dentist of the future, and surgical amputation of roots of the teeth will be the means used in performing cure rather than its attempt by the use of antiseptics.

It is not within the province of the physician and surgeon to indicate the teeth to be extracted or otherwise treated; the intelligent dentist can best determine the possibility of saving individual teeth as well as complete removal of septic foci within the mouth. Neither is it within the province of the dentist to attempt the diagnosis of any general disease by claiming its cause to be oral pus foci.

Team work is a necessity in seeking out and eliminating pus foci.

PRESIDENTIAL ADDRESS ON "PREVENTIVE MEDICINE" READ AT THE ANNUAL MEETING OF THE NEW BRUNSWICK MEDICAL SOCIETY HELD IN SAINT JOHN, IN JULY, 1918

By F. H. Wetmore, M.D.

Hampton, N.B.

I SHALL first refer to sundry matters of general interest, such as have usually been mentioned by the gentlemen who have preceded me in this office; and then it is my purpose, as indeed it is my duty, to bring before you some of the more important phases of the subject of preventive medicine, especially from the point of view of the more recent advances in medical science, keeping in mind the needs of the hour, and of this province in particular.

Before beginning, let me express to you my heart-felt thanks for the great honour conferred upon me by you, my medical confrères, in electing me to the high and responsible position of President of the New Brunswick Medical Society.

This Society was organized at Fredericton on July 19th, 1881, just thirty-seven years ago. Of the thirty-seven members then present, the following are still living, namely: Drs. Atherton, James Christie, G. M. Duncan, Sprague, Inches, D. R. Moore, and Burnett. In 1882, Drs. Thomas Walker, J. W. Daniel, and J. N. Smith had joined. To these, and to those who have passed away, the profession owes much, such as the inauguration of the New Brunswick Medical Act and Amendments thereto, and the formation of the Medical Council.

It is fitting that I should refer to the death of one who was present when our society was organized, who was a member of the first medical council, and a regular attendant at the meetings of the society for many years. I allude to the late Dr. Boyle Travers, a resident of this city, who died in April of the present year, old and full of honour, at the advanced age of ninety-four. To day we feel the loss of another member of our society who passed away while yet

in the prime of life, just after our last annual meeting. I refer to the late Dr. T. Dyson Walker of this city. At home or abroad, he was ever endeavouring to improve himself in his profession, that he might make himself more useful to his patients. He was a faithful member of the staff of the public hospital here for many years, and had obtained more than provincial eminence as a surgeon. For many years connected with the 8th Field Ambulance, he rose to the rank of Lieutenant-Colonel, and, although in poor health, tried to the last to do his bit for his country at Aldershot. He was a particularly active member of both the local medical and of this provincial society. He was ever thoughtful of others, his sympathetic nature showing itself in his doings rather than by words. At our meetings he was usually to be found trying to make it pleasant, socially and otherwise, for our visitors.

The following members of our society, in common with medical men and women from other parts of the civilized world, responded to the call of duty, left their practices to risk their health and their lives, in the service of their country and are still overseas, namely:

Colonel Murray MacLaren, Lieutenant-Colonel G. G. Corbett, Major S. S. Skinner, St. John; Major Laughlin, Milltown; Major Murray, Sussex; Captains T. H. Lunney, D. C. Malcolm, J. A. McCarthy, E. J. Ryan, H. L. Walker, W. Warwick, St. John; Captain Dyas, St. Stephen; Captain Lawson, St. Andrews; Dr. Margaret Parks, St. John.

The following members were overseas and have recently returned and we cordially welcome them to our meetings: Captains S. S. King, Hampton; E. A. Thomas, C. M. Pratt, St. John; W. Ruddick, Sussex; E. V. Sullivan, St. Stephen; Disbrow, Dalhousie; Losier, Chatham; A. E. Gardiner, McAdam Junction; Dr. L. deC. McIntosh, Hartland.

The medical men whose names have been mentioned as having gone overseas, as well as those who have not yet been across the Atlantic, are doing their bit in this world-wide struggle in which civilization is at stake. And the great mass of the people, at home or abroad, are giving their lives, their wealth or their labour for their country. The duty of medical men remaining at home is to endeavour to improve the conditions of the country for the benefit of our returned soldiers and their families, and to save the lives and conserve the health of the rising generations. This can best be done, not only by curing disease, but principally by doing away altogether with its causes.

Bacteriology, the study and practical application of the teach-

ings of which about half a century ago, rendered the name of Pasteur immortal and through Sir Joseph Lister made possible the present wonderful success of operative surgery, is the reconstructing force in the newer methods of dealing with public health. For the best scientific application of our knowledge to the treatment of many surgical and medical diseased conditions, the bacteriologist and pathologist is an essential. Wherever a serious and up-to-date effort is being made to prevent and cure germ infection, there you will find the bacteriologist. He is in the army, and in the navy, whether they be in active service or otherwise.

The epoch-making success in the treatment of infected wounds, on the germ-laden soil of France and Flanders, was rendered possible by his investigations. The removal by the surgeon of the first germ-sodden layer of the soft tissues in the wound area, followed by immediate suture and the use of antiseptics to prevent further infection, have given such success in saving life and preventing disabilities as to make us proud of being members of the medical profession. And it is worth while in passing to mention the names of these antiseptics that in their usefulness even in civil life are likely to supersede the old and tried carbolic and mercurial preparations. That gas which, contrary to all the customs and usages of warring nations, nearly won for the enemy the coveted prize of the Channel ports, and gave the opportunity for our soldier representatives to win undying fame for the name Canada at the second battle of Ypres, is the same gas, chlorine, which is now used to purify water and to disinfect wounds. First Dakin's solution was used and later Dakin's chloramines. Chloramine-T called "Chloramine" in watery solution, is likely to remain with us. Dichloramine-T, in which the cholrine is in a still more stable form, dissolved in chlorinated oil, is, one would think, likely to become generally useful for industrial surgery, especially in hospitals. The wounds do well, the dressings are painless, because the oil prevents the gauze from sticking, and time and expense are saved. There is a wonderful saving in dressings alone and in the time and trouble required to sterilize the same. But this is a digression from my subject.

From the fact of the passing of a new and up-to-date public health act by our legislative authorities, which, I am told, is about to be put in force, we trust and believe that a new era in the prevention of disease is about to be inaugurated in the Province of New Brunswick. If such be the case, then the one thing, more than any other, that makes us believe that it will be successful, is the

fact that there has been appointed for the province by the legislature, a highly trained and competent bacteriologist, Dr. H. L. Abramson, formerly assistant to Dr. Parks, of New York. Credit for this appointment should be given to the medical gentleman who represents the city of St. John in our provincial legislature, the Hon. William F. Roberts, Minister of Health, who for ten long years struggled to bring it about. And let me here say that I consider it the duty of medical men throughout the province to give the honourable gentleman every assistance in the new and difficult task before him. Along with the privileges granted to the profession under the medical act, is their responsibility to the State in reporting gratuitously, for the purpose of perfecting our vital statistics, both births and deaths, and cases of contagious disease.

The old idea concerning the prevention of disease was to improve the general health of the body and to attend to cleanliness, both personal and of our surroundings. The prevention and control of disease in the militia has taught us, however, or at any rate, has forcibly impressed upon our minds, the fact that this is not sufficient; but that the individual must be protected when possible by special means against each separate disease. We do the latter by rendering him immune by vaccination against smallpox, and typhoid and paratyphoid fever. And the cleanliness that is required is not general cleanliness, but the specific cleanliness that will keep him from taking into his system the germs that come from an infected human being or animal. The old idea sought the germs in man's surroundings, the new finds them in man himself.

The germs present in an infected individual leave the body by the main orifices of the body, the nose and throat, the bladder and the bowels in the discharges. A well individual becomes infected by taking these germs in through the mouth or nose (venereal disease is an exception to this rule). Tuberculosis, typhoid fever, diphtheria, cerebro-spinal meningitis—whatever the disease, the specific germ which is the cause does not develop outside the body, except rarely and temporarily in milk or water, and when carried by flies. These discharges get from the sick to the well by means of the mouth spray getting on the food (as in tuberculosis) or by the hands containing the germs in the discharges from the bladder or bowel (as in typhoid fever). In this way, as well as by the mouth spray, food is infected. The inanimate bodies—the *things*—thus smeared with the discharges are dangerous, that is, infectious, only when the discharge is still fresh and moist. The bacillus typhosus, for instance, will die in two weeks' time in water. For

the germs of all the infectious diseases are incubator plants or animals, and cannot live for any length of time outside their host, the human body.

And the known cases are only half the danger. In typhoid fever, for instance, missed cases (the mild, early, convalescing, unrecognized and concealed cases) and typhoid carriers must be sought for and supervised. The carrier is a person who, while in good health himself, has the germs in his system, and gives them off in the discharges from the bowel or bladder. If he is employed in the preparation or care of food, he is probably the cause of an outbreak of typhoid fever, while the early cases before the disease is recognized, the convalescent cases that are not isolated for a sufficient length of time, and the mild unrecognized cases, are the cause of the continuance of the outbreak.

And what has been said of typhoid fever applies to other infectious diseases. In diphtheria the contact case that is the cause of the outbreak, is the mild unrecognized case, or the convalescent case still giving off the specific germs in the mouth and nose discharges. And it is the same with the scarlet fever *contact* case. Here, too, contrary to our past belief, it is the discharges from the throat, and not the peeling skin, that contains the specific *materies morbi*. And so with measles, german measles, mumps, whooping cough, smallpox, chicken-pox and, of course, tuberculosis (human), venereal diseases, trachoma, cerebro-spinal meningitis and leprosy. In all these the *contacts* are the "wolves in sheep's clothing," as Prof. H. W. Hill puts it, that require to be hunted down. Eliminate contact cases and you eliminate other forms of infection also.

It is the physician's privilege to treat the diseased individual. Prevention is a governmental function. In order to find these contact cases, to prevent their discharges from getting into our food and water supplies, and to avoid the contact of the uninfected with the infected, a modern, up-to-date Public Health Department requires experts, the vital statistician, the epidemiologist, the laboratory man, and the sanitary engineer.

On account of the great number of cases, their abiding presence, and their vital importance to the welfare of the race, now and in the future, I shall speak more particularly of two infections, namely: tuberculosis and venereal diseases.

Tuberculosis kills five times as many people as all the diseases usually "disinfected" put together. While diphtheria germs flourish only in the nose and throat, and typhoid germs in the intestines only (possibly in the blood), the germs of tuberculosis flourish al-

most anywhere in the body, in the glands, bones, joints, intestines, kidney, brain, and lungs. The germs of all three diseases gain entrance to the body by the mouth, chiefly through the *hands*, also through food and milk, and in typhoid fever by water and flies. Only the germs of diphtheria that lodge in the throat cause disease, only the germs of typhoid that lodge in the intestines cause disease.

The germs of tuberculosis go into the intestines, and then into the blood, settle in that as in a river, and lodge some in the lungs, some in the joints, and others in the bones, glands, or kidney. We do not breathe germs into the lungs. In tuberculosis of the kidneys the germs escape from the body by way of the bladder, and in intestinal tuberculosis in the bowel discharges, but the main source of infection is the lungs. From a highly infectious case, twenty-four billion germs may escape daily, although from an ordinarily infectious case only four or five billion are given off. As mentioned before, these are carried by the mouth spray, and on the hands. The form of tuberculosis that children get from drinking the raw non-pasteurized milk of tubercular cows, affects chiefly glands and bones, does not cause disease of the lungs and therefore cannot be communicated from one human being to another. It is only in the bodies of their victims that these germs find the peculiar food, high temperature, abundant moisture and darkness which is essential for their continued development. A visual census of infectious germs then would find them only in humans (or animals) and in their immediate neighbourhood. The open cases of tuberculosis are the cases carrying active, living, growing germs in the lungs, germs escaping to the outside and reaching other persons' mouths. In our climate *one* person in every five hundred of the population is an open case. That would mean over one hundred for this city and about seven hundred for the province.

The common-sense method of abolishing tubercle bacilli from off the earth would be first to hunt for the open cases and prevent them from infecting others by the mouth spray and the hands. To quote Prof. H. W. Hill, many of whose ideas I have made use of in this address, "Hunt with ingenious, skilful, diligent, sagacious, well-trained hunters, epidemiologists as devoted and persistent in their work as the average insurance agent is in his, men who devote themselves to the abolition of tuberculosis as wholeheartedly as any merchant does to making money." Begin with the known cases, and search the zones of infection surrounding each for the mild, unrecognized and concealed cases Place the open cases where they can spread disease no further. Thus you stop further infec-

tion. To do other work and not do this is but scouting. Keeping in mind the idea of the visual census, let us train our guns (the expert diagnosticians paid by the State) on the main masses of the enemy (the bacilli in and around the "open" cases); let us destroy what we can (by disinfection), and carry off the remainder to our detention camps (our county hospitals). In this city there is a hospital for advanced cases of tuberculosis capable of accommodating sixty-three cases, little more than half what the city requires. For the rest of the province with over six hundred open advanced cases, as far as I am aware, there is no accommodation. It is true that there is a sanatorium at River Glade, but that is for the early, curable cases, and rightly refuses to take those of an advanced type.

The early cases should be advised to go to a sanatorium or, failing this, they should be supervised at home. The River Glade Sanatorium is an educational institution, teaching the tuberculous how to live. And each discharged patient is a centre for the spread of the knowledge of correct living. The institution has had its influence on the doctors of the province as well, giving them an opportunity to learn the view-point of the disease, and acquainting themselves with better methods of early diagnosis (this more especially at the tuberculosis clinics). And this is no easy matter, for the tuberculosis specialist is a highly trained individual. To learn the view-point one must take advantage of every opportunity, for it is "precept upon precept, precept upon precept, line upon line, line upon line, here a little and there a little".

We are only now beginning to realize what a great work has been accomplished in the campaign against tuberculosis in this province, by this institution and the clinics carried on in connection with the same. Dr. Townsend, who recently resigned the position of superintendent, to enter a wider field in patriotic work in his native country to the south of us, was an able expert who had received exceptional training in his specialty on both sides of the Atlantic. The members of the profession are indebted to him for many favours, and he will be greatly missed.

The profession is also indebted to the medical superintendent of the St. John County Hospital for his untiring efforts in teaching them somewhat of his specialty.

I would offer the suggestion that the department of health, as soon as possible, use all its influence towards providing means of segregation of advanced and highly dangerous cases of tuberculosis throughout the different parts of the province.

Also that tuberculosis clinics be established in other localities in the province than where they have up to now been carried on. Possibly the plan said to be carried out in Nova Scotia might be adopted, namely: that physicians in certain centres of the province, more or less expert in the diagnosis of tuberculosis, might be paid by the State to do government work of this kind.

Perhaps because the returned soldier problem is drawing more attention to the question among civilians, venereal disease is rivalling in importance tuberculosis. The report of the Commission of Conservation on "The Prevalence of Venereal Diseases n Canada", published in pamphlet form in 1917, shows the importance of the subject. At the Toronto General Hospital from 12 to 14 per cent. of the patients admitted to the public wards were found to be infected with syphilis, inherited or acquired, and 66 per cent. of them were not aware of the fact. The report of the New York City Department of Health, 1914, states that of the six million of people in New York City, 25 per cent. have venereal disease of some kind.

The public should be taught that the disease is highly infectious at certain stages, and that in early adult life chronic affections of the blood vessels and nervous system are usually caused by this infection, such as aneurism of the aorta, angina, a paralytic stroke between forty and fifty years of age, locomotor ataxia, and general paralysis of the insane. The public should be taught that the disease is transmitted from the parent to the child before birth, and is frequently the cause of successive miscarriages and still-births. Or the offspring may live and be defective physically mentally, and morally. Thus may the "sin of the fathers be visited upon the children, even unto the third generation". And this is but a glimpse of the subject. It has been said that 50 per cent. of all cases of sterility in the female, and 40 per cent. of all cases of congenital blindness are due to infection by the other form of venereal disease, gonorrhœa.

A more enlightened view of venereal disease by the general public will force our legislative authorities, Dominion, Provincial, and Municipal to expend more money for its control.

Dominion authorities who make and control the immigration laws, and who control the militia, should see that infected soldiers are cured before they are allowed to return to their families.

TERMINAL DISINFECTION

By W. H. Hattie, M.D.

Provincial Health Officer, Nova Scotia

THE days of real heroism have not yet passed. Men not only face as unflinchingly as of yore the death dealing mechanisms of war, but they still dare to attack the entrenchments of custom, of prejudice, and even of affection. There is no sphere of human activity which lacks its champions of reform or at least of change. Few of us can abide monotony. For most of us there is much charm in adventure, and for many of us there is no diversion more tempting than a tilt at some time-honoured and widely advocated practice, especially if it be supported by the firm and unquestioning faith of a dominating cult.

For generations the fumigant of the big smell has had an established grip upon the affection and the imagination of the people. It has been reverenced as the great deliverer from plague and pestilence. It has been the comfort and support of those who have made sacrifice to the insatiate maw of infection, whose dread of further tribute would otherwise be overwhelming. It has been the *raison d'être* for a multitude of sanitary inspectors and various otherwise dubbed officials, who, save for it, might never have ornamented our public health organizations. In short, it has in various ways influenced the fabric of human achievement. And yet, of recent years, there has arisen and flourished a sect which disputes the efficacy of fumigation, which likens its practice to the loathsome rites of witchcraft and kindred mummery, and which demands its abolition as an expensive, mischievous, and pernicious deception, to which no honest and intelligent man should give countenance.

A tribute to heroism is never amiss, and one may be permitted to express his admiration of the valorous temerity of those who initiated and support this heterodoxy, who shrink not from assaulting the strongholds of the hierarchy of fumigators, and who, when reviled, revile again. But I wish to merit a certain reputation for

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Read before the Canadian Medical Association, June 13th-15th, 1917.

courage myself, and so, thus demonstrating that there is no ambiguity about my position, I unhesitatingly array myself on the fence in the most uncomfortable attitude of strict neutrality—an attitude which not only demands ceaseless vigilance if one is to correctly determine the side upon which ultimate safety lies, but which subjects one to constant imminent danger from the shafts and arrows of both the combatant forces.

I take it that you have already been made aware of the arguments *pro* and *con* terminal fumigation. The arguments against a practice which has endured for so many years, which has given empiric grounds for its continuance, and which has gained such universal adhesion, must be convincing indeed if they are to shake one's faith in its value. Some of these arguments are in reality not easily set aside. There will be few, for instance, who will argue the statement that infective bacteria are most virulent when they first make their escape from the body, and lose in virulence upon exposure to light, air, unfavourable temperatures, etc. No one will claim that fumigation has always been carried out in the thorough manner demanded by the books, or that secondary cases have not been escaped in spite of insufficient fumigation. Nor will one brush aside as immaterial, even if they be regarded as unconvincing, the experiences reported from certain communities in which terminal disinfection has been abandoned. But, on the other hand, one thing which experimentation has made plain is that the resisting powers of bacteria are not less variable than the resisting powers of human beings, and while it is doubtless true that most infective organisms lose pathogenicity shortly after they leave the animal body, it by no means follows that it is the invariable rule. It is quite possible that escape from secondary cases in undoubted instances of incomplete terminal disinfection has been due to nature's beneficent favour rather than to man's clumsy effort at germicide. But in the face of so much experimental evidence that gaseous fumigation kills bacteria, it is rather a broad claim to make that it is useless. Even if imperfectly practised, it is not inconceivable that the addition of the fumigant to the other inconveniences against which the germs have to contend might prove to be the final factor in effecting their destruction.

We have but one laboratory in Nova Scotia in connexion with our public health service. To this, swabs from suspicious throats come from the most remote parts of the province. This means that the germs contained on these swabs are subjected to conditions scarcely favourable to their persistence for periods of frequently

forty-eight to sixty hours. Yet positive cultures are often obtained from such swabs. Does this not place some doubt upon the assumption that disease germs lose virulence very rapidly upon their escape from the body, and lend support to the contention we still hear from various sources that infection may be carried in fomites for considerable periods of time?

There can be no doubt of the need for stressing the supreme importance of what is termed concurrent disinfection—a term, by the way, which should be authoritatively defined if it is to be thoroughly understood. In communities where the public health service is well organized and liberally financed, it may be possible to carry out concurrent disinfection in so complete a fashion that terminal disinfection may be superfluous. But such communities, up to the present, constitute a very small minority. Practically everywhere, infectious conditions must still be treated under circumstances which render terminal cleansing imperative, and such terminal cleansing can rarely, except in cities and considerable sized towns, be assigned to trained and competent persons. Seemingly, therefore, there will be many opportunities for fumigants to supplement the efforts of the little-experienced nurse and the quite inexperienced scrub-woman. If fumigants are valueless as germicides, their employment would of course be futile, but I do not think that anyone has taken such extreme ground as to deny them germicidal power.

Most of the evidence we have of the disinfecting properties of the gases ordinarily used in preventive medicine has been furnished by laboratory workers who have used cultures of various bacteria in their experiments. We are perhaps too prone to assume that bacteria grown *in vitro* have the same characteristics as those grown in the animal body. The artificial conditions under which bacteria are cultured in the laboratory must demand of them the development of some of the powers of resistance of which we suspect them to be capable. Consequently it is not impossible that the experiments which have afforded us the bulk of our knowledge concerning the disinfectant gases have been carried on with bacteria which have already become somewhat accustomed to adversity and are therefore more resistant then germs but recently liberated from the congenial soil of the animal tissues. One feels, therefore that it is quite likely that germs which have not accrued such possible increased resistance, but which have on the contrary been already somewhat weakened by lack of nourishment and exposure

to light, air and dessication in the sick room, may perish more rapidly than the laboratory breed when exposed to the action of fumigants.

A point which is not infrequently urged by opponents of gaseous fumigation is that gases have limited powers of penetration. This must be admitted, but the statement is equally true of bacteria. If, then, we do not deliberately enfold bacteria in articles to be fumigated, they are unlikely to find lodgement where the gas cannot reach them.

It cannot be doubted that fumigation is quite too often undertaken by those who do not appreciate the need for taking into account the various factors necessary to secure satisfactory results. To this may be attributed, in large measure, the doubt in the efficacy of fumigation which is becoming so widespread. It is, however, unfair to condemn a measure which is insufficiently tested. Rather should we insist upon the necessity of meticulous attention to all details, such as complete closure of the apartment, proper temperature, proper humidity, quantity of gas generated, and time of exposure, in order that the fumigant may be given a real opportunity to effect its purpose. The mere statement that fumigation as ordinarily practised is useless can scarcely be considered as an argument in favour of its disuse.

There are several things of which I am quite convinced. Much of the fumigation which is being done is worthless, and represents a needless waste of money and material; much of it engenders a sense of security which is unjustified and is responsible for consequent spread of infection; some of it is unnecessary, because of the thoroughness with which "concurrent" disinfection is being attended to. My position in the matter of fumigation is stated in the following excerpt from our Nova Scotia Rules for Quarantine and Disinfection: "*Fumigation is useless unless carried out with the most precise attention to every detail.* In several places it has been abandoned, but where there is any doubt about the care given to the immediate destruction of infectious discharges, and unless the case has been throughout the illness under the care of an efficient and conscientious nurse, it is advised that it be practised."

I should be delighted if I could see my way clear to advocate the abolition of a practice which costs money and which causes much discommodity. I am hopeful that in process of time I may be able to take such a position. Meanwhile, in the absence of conviction, though with a real desire to be convinced, I sit wary and uneasy upon the fence.

WHY FEDERAL LEGISLATION IS NECESSARY IN ORDER THAT VENEREAL DISEASES MAY BE EFFECTIVELY DEALT WITH IN CANADA

By Peter H. Bryce, M.D.

Chief Medical Officer, Interior, Ottawa

IN discussing a subject of such wide reaching importance as legislation dealing with venereal diseases effectively, it is well for us to refer briefly to the history of legislation dealing with other difficult public health problems. I recall the remarks of a Kentucky legislator at a conference of State Boards of Health, held many years ago, with regard to the isolation of smallpox and other acute diseases. While commenting upon the thorough-going methods which were advocated at the moment for dealing with smallpox, etc., he said that he did not know how it was up in Canada where they seemed to be able to do these things; but if anyone attempted to put compulsory isolation in force in Kentucky it would have to be by a shot-gun quarantine of the most positive character if it were to be successful. The history of public opinion in the matter of compulsory notification of tuberculosis is equally interesting. In 1894 the Board of Health of New York City notified physicians that it was prepared to examine the sputum of suspected cases of tuberculosis and invited their co-operation. In 1896 this routine had become so well established that the Board made notification compulsory and in 1912 the rate of notification was 2·9 for every death recorded in that city. The decline in the death-rate since 1896 had been nearly 50 per cent. The same history of progress in dealing with tuberculosis has been seen in other countries as in Great Britain and Canada; while it can be asserted that the progress of medical knowledge with regard to tuberculosis and venereal diseases, as with diphtheria, plague, etc., has been accompanied by an elevation of our ethical views in the matter of our duty to the public in controlling such diseases. But this appreciation of duty

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Read at the forty-eighth annual meeting of the Canadian Medical Association, Montreal, June 15th, 1917.

grows also in the mind of the individual whose knowledge regarding the disease he may be suffering from increases. He also will develop an increasing consciousness of the responsibility which he owes to the public as well as himself of protecting against dangers of which he may be the direct agent.

It has been the growth of exact knowledge with regard both to the cause and clinical and bacteriological phenomena presented by syphilis, which has especially drawn medical attention, and with it that of Society, to the extreme importance which the prevalence of the disease and its persisting results produce, that have brought about legislative action by Departments of Health and social workers in those countries having the most progressive governments. It is ten years since Wassermann worked out the reactions associated with blood from patients suffering from syphilis; while the later discoveries of Noguchi of the spirochæte as the cause of the disease have enabled the most progressive Boards of Health to give official sanction to work undertaken with the idea not alone of diagnosing cases of this disease, but of organizing effective steps both for its cure and its prevention. Since the year 1911 the Department of Health of the city of New York, stimulated by the positive results obtained by Biggs through the compulsory notification of tuberculosis, has undertaken officially to supply means for the routine examination of all patients, suspected of suffering from the disease, whose blood was sent to the Department by physicians. In 1912 a clinic was established by the Board of Health to which patients were free to go and have the test made. So naturally has the demand increased during the past six years that clinics have been established in the various boroughs of the City of New York. These are open every morning and several nights a week and the attendance at these and the number of specimens examined may be judged from the fact that in 1916 the average daily attendance at the clinic was sixty-two, and the number of blood examinations made in the year fifty-six thousand. It had been the work done under such conditions along with the official action taken in Denmark and one or two other countries for not only the official treatment of patients, but for the compulsory notification of cases by doctors having charge of such to the health authorities, which have been the means of bringing this whole problem both from its medical and its social standpoints before the attention of the legislators of many countries as Australia, Great Britain, and some of the States of the American Union and Canada. The presence of the millions of men in the armies in the field and the attention which the prevalence of venereal

disease amongst the soldiers of the various armies has forced upon the officials' attention of the Army Medical Service of every country, have still further brought into prominence the very serious effects resulting from the prevalence of the disease and the urgent demand for legislative methods adequate in some degree to control it. In Great Britain in 1914 a Royal Commission was appointed to study the various phases of the venereal disease problem and in 1916 brought in a report making a series of definite recommendations which have been in large degree put into effect under a bill known as the Venereal Diseases Bill. This Bill is during the present session being amended by further legislation intended to make its operation still more efficient. The methods, which are to be put into force by the Medical Officer of the Local Government Board whose position represents that of the official health officer of each province in Canada, are similar to those for enforcing the law regarding other contagious diseases so far as the two classes of disease are comparable, while the local county health officers are required to undertake the duties within their respective districts.

Briefly what has been undertaken in Great Britain is that literature is distributed by the Local Government Board through the County Boards of Health to all practising physicians in the United Kingdom, supplying details of the requirements of the Act and of how the Department is prepared to assist physicians in caring for their patients, who suffer from these diseases. The Local Government Board requests County and Borough Officers of Health to make arrangements with one or several general hospitals within their area for providing special clinics for both the free diagnosis and treatment of cases of this disease who apply directly to the clinic or are referred to it by practising physicians. The Boards of Health have to be sure that the clinicians especially appointed to the work by the hospitals have had special training in laboratory technique, both for the diagnosis and the treatment of cases. These clinics and their officers have further to be approved by the medical officer of the Local Government Board. The work has been rapidly pushed forward since the beginning of this year in England so that some three fourths of the Borough authorities have already complied with the requirements of the regulations so far as the clinics in the several Health districts are concerned. When such provisions have been supplied by the local authorities the Government Board at once undertakes through general supervision the carrying out of the Act throughout the whole country. It further provides that 75 per cent. of the expense of the work thus

carried out by the local health authorities shall be borne by the Government. This goes even so far as to provide for the free transport of poor patients to the several clinics.

Such in general outline is the scope of the Act in England, intended to limit the prevalence of this, the most serious of all constitutional diseases.

It is evident that nothing except the most thorough co-ordination of the machinery both of the general and local governments assisted by the practising physicians, can serve to seriously lessen a disease whose origin and dissemination are in a category so different from that of the ordinary contagious diseases. It has been of course at once recognized that two essential difficulties attach to the successful dealing with the disease, viz.: that of obtaining knowledge of the existence of cases and that of regulating the actions of patients after they have come under treatment. In 1913, in four of the best New York clinics 8 per cent. only were discharged cured, 17 per cent. ceased treatment of their own accord and 70 per cent. ceased treatment unimproved. In the best Boston clinic 12 per cent. were reported cured. With regard to the first point, there has been raised with much persistence the old objection which has been raised with regard to every disease known to us, that of the individual rights both of the patient and of the private practitioner. As we recognize to-day, such presumptive rights have no ethical reason in their favour if in any way they contravene laws which are for the general good of the community. But it is being rapidly recognized with regard to these diseases, as well as others, that the individual interests of the whole community will best be conserved when official knowledge exists regarding the existence of cases so that they may be assured expert treatment; while at the same time they may be prevented from becoming a direct danger to the public. We thus see that it is merely a question of present judgement on the part of the public health authorities of any country to determine at what moment and in what manner official notification of the existence of cases can be brought about. The advantage of having clinics officially recognized, where trained physicians will be present not only to diagnose but to carry out treatment in the most scientific manner possible, makes it evident that the regulation of cases will soon become generally viewed from the standpoint of the advantages it brings to the patient himself. But the advantages of such registration and clinics for treatment extend very much farther than to the patient alone, since they at once bring those of ill-regulated lives into touch with authorities, who are going in

large measure to enforce rules of conduct which will prevent such patients from becoming a danger to others during the period of their treatment.

The discussions of the situation at public meetings recently in London disclosed the fact, brought forth by the Attorney-General, that there was nothing in the existing law of England, which rendered it criminal for a person suffering from venereal disease, and being cognizant of the fact, to communicate the disease to another. This matter is also being remedied by the amendment to the Venereal Diseases Bill, at present passing through the House, making further provision against the treatment of cases of these diseases by unqualified chemists, non-registered practitioners and other persons. This legislation prohibits any advertisement by public notice or printed circular or by label of any medicine for the prevention, cure or relief of such diseases. The reasons for such amendments are obvious from the evident fact that it is only by treatment of an exact scientific sort, accompanied by examination of blood from time to time by trained men, which will enable the progress toward cure of these cases to be accurately estimated. Such provisions are further in the interest of the patient and are essential in order that when cured he may receive a certificate to that effect, which will render him free from danger of prosecution.

From what has been said it is therefore apparent that any scheme which is going to deal effectively with this disease must be not only of a scientific but of a most comprehensive legislative character. If the law should seem drastic it must be remembered that nothing can be too much so if it shall succeed in protecting innocent persons from the danger of infection with a disease whose transmissibility may go on from generation to generation. Until quite recent years what to do could not be determined because the proof of the cure of the disease through actual blood tests was not possible. On the other hand, it is quite apparent that no measures of a legislative character other than those of the most scientific kind ought to be adopted, otherwise the benefits anticipated will be seriously curtailed by unfortunate results growing out of inadequate treatment and certificates of cure issued contrary to the actual facts.

In Canada, as elsewhere, the centres where these diseases are prevalent are always those where are aggregations of people in cities, in camps and in other centres resulting in a more or less unstable and drifting population. In centres where adequate sanitary organizations and Health Acts and regulations are already

in existence a routine may easily be adopted adequate to the needs of the situation as seen when outbreaks of smallpox for instance have to be dealt with. It is in such centres almost everywhere to-day that hospitals exist to which are attached physicians who shortly could be effectively trained for the scientific treatment and management of such cases. It goes without saying that to obtain adequate results a definite expenditure of public funds will be essential; but no objection can be raised on this ground, because the public realize that it is itself that is being protected. The very nature of the case, however, makes it evident that it is unreasonable and unfair to place the expense of the free treatment of patients upon any particular municipality and hence it would result as has been realized in England that the general Government is the authority most immediately concerned in the interests of the whole people in enforcing the provisions of any Act of the kind indicated. But more than this, the expenditure of funds, whether federal or provincial, must carry with it an assurance that the regulations for carrying out the Act will be not only comprehensive, but also be the same for every Province and district in the country and further that with the regulations will go provisions for harmonizing and co-ordinating through official inspection the work in all the hospital centres, especially organized for it. It is as if we were supplying uniform weapons and explosives for a whole army, which would be of the same quality and effectiveness for every unit. It is to be hoped that in Canada the serious dangers already existing, and which war conditions will serve to accentuate, will result in the early adoption of legislation and regulations adequate for the purpose of limiting the prevalence and lessening the ravages of this type of disease.

I have not touched on the point of notification and registration of cases of these diseases, since it is apparent that with the establishment of special clinics and the supplying of free salvarsan treatment, the desired ends of scientific inoculation and supervision of cases will automatically follow if certificates of cure can be given only through official channels and the absence of such make the liability to criminal prosecution for violation of the provision of law against contact always operable. It is, however, apparent in view of the diversity of provincial health laws and the supervision of hospitals and similar institutions in Canada that some general federal legislation for all Canada is essential to the successful treatment and control of venereal diseases. Assuming that the methods being worked out in Great Britain are applicable here, the situation

demands that there shall be a Public Health authority in Ottawa to administer through Provincial Boards of Health and Hospitals the details, while arrangements must be made with provincial hospitals whereby skilled clinicians will not only diagnose the disease, but administer the specific cure. They must register all patients on common forms and keep careful records of cases. Should a patient move from one province to another he would continue to be amenable to the same laws and penalties for its infringement. Moreover such regulations would provide for the payment of a definite proportion of the cost of administering the law and the treatment of patients by the federal authorities. By such provisions the clash of interests which has been the case with tuberculosis cases regarding the responsibility for the cost of patients moving from one province to another would be avoided. The work would be standardized and the same authority that now deals with immigrants at our seaports would assume control of them after admission during their probation period. What the situation seems to demand is a resolution setting forth the dangers to the public and to the nation of the presence and continued prevalence of venereal diseases amongst the people, the existence of well attested means of treatment and cure and a statement both of the need for federal legislation to co-ordinate official action between the federal and provincial authorities and some indication of how this can best be brought into effect.

Nearly one hundred English nurses have been awarded the soldiers' silver medal "for bravery in the field". The French army has conferred the Croix de Guerre on Nursing Sister Anna MacKinnon, a British Nurse attached to the French Flag Nursing Corps.

Three American women doctors have received Lieutenants' commissions in the French army. They are Dr. Caroline Finlay, Dr. Anna von Sholly, and Dr. Mary Lee Edward, all of New York and attached as surgeons to the military unit of the women's overseas hospitals. The three received decorations from the French Government for excellent surgical work recently performed under heavy bombardment, and after that their commissions. The French surgeon in command of the hospital at the front in which they were working has given them the highest praise, and has been quoted as calling Dr. Finlay a "model surgeon".

ADVANTAGES OF THE EARLY DIAGNOSIS AND TREATMENT OF SYPHILIS

By G. Orville Scott, M.D., *Captain, C.A.M.C.*

THE idea of my paper this afternoon is to avoid theory; to evade the pathology, but to try and convey to you all the importance of early diagnosis of syphilis. If I can impress this fact, and if every medical officer here regard any sore on the genitals as specific until proved otherwise, then we have expended our time to the greatest advantage and actually saved this afternoon thousands of dollars to the government, increased the efficiency of every unit in this area, and greatly helped to keep our overseas divisions up to fighting strength.

As you all know, the disease of syphilis is caused by the entrance into the tissues of the treponema pallidum; its methods of entrance are in order of frequency: coitus with an infected person; contact other than sexual, with diseased individuals; congenital, and lastly, those we occasionally see where it is absolutely impossible to trace the mode of entrance, or connect them with a specific history in any way.

The incubation period is, beyond a doubt, very much shorter than many of us were led to believe a few years ago. I have personally examined many cases who developed a primary sore one week after contact, from which the treponema pallidum could be obtained. Of course, in forming an opinion of incubation periods, you must necessarily take into consideration the man's statement, and also his intelligence. However, there are cases I know where it was a physical impossibility for the man to have had any contact with a member of the opposite sex for months previous. I cannot say what the maximum incubatory period is; it may be three or four, or more, months. I am particularly dwelling on this subject as I see cases nearly every day in which the medical officer has been led astray, and temporarily put off the diagnosis. Men come to me, late in the primary stage, and often not until the disease becomes clinically generalized, with the same story; that is: "I reported to

Read at a meeting of Clinical Society, Canadian Hospital, Etchinghill.

my medical officer the first day the sore appeared. He told me not to worry, as it was too early to develop any specific infection. Keep it well washed with any antiseptic, and it will soon disappear."

The man naturally labours under the faulty delusion that it is only a chafe, or was caused by uncleanliness. The result is a false sense of security; meanwhile the chancre continues to develop, and the patient may not report again till the secondary rash appears. As for the chancres, they vary from the most innocent looking erosions to the malignant phagadenic type. They are, often as not, multiple, and may be located anywhere on the body. I shall deal with those on the genitals first. The most common site in order of frequency is in the sulcus; the roll of the prepuce; on the body of the penis; on the glans; on the scrotum, and intra-urethrally. The commonest type of sore seen is the papulo-erosive. There is very little loss of tissue; the surface inflammation is practically negative; the base is clean, with slight serous exudation and induration is always present to a greater or less extent. This latter characteristic being the most diagnostic feature. Very frequently in the hospital, we find cases who have been under treatment for gonorrhœa developing a small indurated area on the mucous membrane of the roll of prepuce. There has as yet been no loss of tissue; that would take several days longer.

Cases of this kind should receive most careful consideration. The patient should be sent to the laboratory, the mucous membrane over the indurated area denuded and a smear taken. Provided it be negative, the process should be repeated the following day, and so on till you have absolutely satisfied yourself and are positive in your diagnosis. It will only be a matter of a very few days till the experienced syphilologist can make a diagnosis. The condition will, in all probability, develop into a typical small, papulo-erosive chancre, that will clear up in a week under proper systemic, as well as local treatment.

In the primary stage of syphilis, the medical officer can look for only one other clinical diagnostic feature, *i.e.*, the lymphatic system. At the time of even the first appearance of a chancre, however insignificant it may appear, the inguinal gland will give you that typical shotty sensation on palpation. Following very rapidly on their appearance, the posterior cervicals will become involved; also the axillary and epitrochlear at a little later date. Personally, I place most diagnostic value on the shotty cervicals. To make a diagnosis of syphilis in its primary stage, we have the following to guide us: the sore, the lymphatic system. These are

the only clinical evidences we have. But here the laboratory comes to our assistance with the invaluable dark ground smear. It is absolutely useless to do a Wassermann test. The report, provided it is the patient's, of luetic infection, will be negative, and will only mislead both the patient and his physician.

Provided the medical officer can appreciate what he can see and feel, and be familiar with the technique of the dark ground smear, or else have the assistance of a pathologist, there is absolutely no excuse in making a faulty diagnosis.

I have referred to the most common type of sore. The next in frequency is the papulo-ulcerative variety, in which there is considerable loss of tissue, The base is usually dirty, and the induration is marked. There is usually more surface inflammation; glandular involvement will be more pronounced; but in the inguinal region only; occasionally the condition advancing to suppuration.

The third distinct type of chancre is the phagadenic, which fortunately is comparatively rare, as compared with the above two. It is intensely malignant in type, and may involve a large area. It responds only very indifferently to local, as well as systemic treatment, and if left untreated may cause a gangrene of the entire penis. I have had three cases in the past month that were admitted to the hospital just one week after the first appearance of the sore. In two of these cases, the ventral surface of the glans, the entire prepuce, and the urethra, to the fossa navicularis, sloughed away. The third lost almost one half of the glans, and the ventral surface of the prepuce, but fortunately the urethra was not involved.

These, of course, are the more malignant type of phagadenic chancres. In any case of this type of sore, there is an inguinal adenitis, which may or may not suppurate. The cervical glands, in all types of chancre, on the genitals, retain their typical shotty characteristics. It might be well to mention here that no caustic or antiseptic of any description should, under any condition, be placed on a sore before a positive diagnosis is made. The caustic would alter the appearance and characteristics, while an antiseptic solution, not altering the clinical characteristics, would exclude the possibility of a positive dark ground finding. Extra-genital chancres may appear anywhere on the body. The most common sites are, in order of frequency, in the neighbourhood of the symphisis pubis, on the inner side of the thighs, on the lips or chin, on the fingers, and on the tongue. The types seen are the papulo-erosive or the papulo-ulcerative. Personally, I have never seen phagadenic chancre extra-genitally. The same general clinical picture

is given, and, of course, the patient should receive the same routine treatment.

If primary syphilis be not early diagnosed and treated, it becomes rapidly clinically generalized; the average time being from three to six weeks. However, it may be longer or shorter. In this condition, of course, the diagnosis is comparatively easy; for, in addition to the chancre and glands, you have the skin and the mucous membranes to assist you. The chancre, provided it has received no local treatment, may have healed, remained stationary, or increased in size; this, of course, depending on the type of original sore. The glands will be practically identical on palpation, but a greater number will be involved. The skin will show a rash which, in the case of syphilis, is characterized by the following: wide and symmetrical distribution; presence of different types at the same time; absence of irritability; uniformly round in shape. The first cutaneous manifestation of generalized syphilis is the faint rose-coloured rash that appears on the trunk, the favourite site being the abdomen. In its earliest stage it is sometimes very difficult to detect. The appearance of the skin is best described as a mottling. The rash remains only a very short time, and will fade even without treatment. One injection of salvarsan, or one of its many substitutes, will cause it to completely disappear in a few days. The second rash that appears is the maculo-papular; the most common variety being the condition in which the macular characteristic predominates. It appears first on the abdomen, and flexor surfaces of the upper extremities, but very rapidly extends over the entire trunk and arms. Its colour, while not pathogomonic, is fairly constant. It is first pinkish in hue, deepening in shade, and then gradually becoming brownish in appearance, and covered with a dry scaly surface. Where the papular variety predominates, the face is practically always involved, in addition to the trunk and extremities. The forehead, at the junction of the hair, is a favourite site; and, if untreated, it rapidly spreads over the scalp and entire face. The papular skin condition is never seen alone. The papules appear to be superimposed on the macules. In colour, the same general characteristics as in the macular variety are seen, except that the shades are more pronounced; but the papules go on to desquamation in the same way. Where the papular characteristic of the rash predominates, the pigmentation persists for a very long time; we see many cases at the hospital where it has remained for months, even though the treatment has been intensive. In forming our conclusion on the etiological factor of a rash, we must of

course consider the acute exanthemata, and drug rashes. The history and concomitant symptoms, the absence of any marked pyrexia, coryza, or conjunctivitis, or gastric disturbances, should render the diagnosis comparatively easy.

The mucous membranes in this stage are also involved; the throat is always injected and the pharynx granular. This condition always appears to be present in conjunction with the cutaneous eruption.

Of greater diagnostic value, however, are the mucous pacthes, which are almost constantly seen when the rash on the body is well developed. The pillars, tonsils, uvula, soft palate, buccal, mucous membranes, and posterior wall of the pharynx, are covered to a greater or less extent with a thin, pearly, greyish membrane; also the tongue usually shows numerous small superficial ulcerations, covered with this same coloured membrane. Where it has been removed, it leaves a beefy-coloured, shallow ulceration. There is no pain connected with this condition, and the voice is frequently husky. About the anus and the fold of the nates will be very frestantly seen condylomata. They are usually roughly circular in outline, heaped up, deep purplish in colour, and moist on the surface, About the anus they have a tendency to recur, and are sometimes diagnosed as hæmorrhoids. In the intertrigonal space, and on the scrotum, secondary syphilides are frequently seen. These are identical with the condylomata, about the anus. If there still be any doubt about a diagnosis, the Wassermann test can now be applied with a reasonable expectation that it will show a very strongly positive reaction.

There are some individuals, I understand, who will never show a positive Wassermann at any stage, and others who will show a positive reaction a few days after the first appearance of the sore. But these, however, are the exception.

The laboratory substantiation one looks for is a positive dark ground smear in primary syphilis, and a positive Wassermann when the disease becomes clinically generalized.

Our statistics at Etchinghill Hospital show that if a patient be admitted here in the early stages of primary syphilis, his average stay in hospital would be twenty-one days. At the end of this period he has no open luetic lesions, and is therefore not a menace to his associates. He is discharged from the hospital to his unit, but is obliged to return here at stated intervals for the completion of his course, which would require thirty-six days, and thus would

be available for a draft to France in fifty-seven days from the time he was first put under treatment.

On the other hand; if a patient be not admitted till he develop secondary lesions, his stay in hospital as an in-patient will be only slightly increased, averaging twenty-two days; but he will have to continue reporting at stated intervals for treatment over a period of about one hundred and sixty-five days. During all this time he is physically unable to perform full fatigue, and of course is not available for a draft. The balance sheet stands as follows in the majority of cases: Primary syphilis, available for France in fifty-seven days; generalized syphilis, available for France in one hundred and eighty-seven days.

In conclusion, it can be seen how absolutely essential it is that we at Etchinghill have the co-operation of all medical officers in this area. Those few short weeks between the appearance of the primary and the advent of the secondary symptoms, make a difference of almost three times the length of treatment required. What is of infinitely more ultimate importance to the patient and the State is that the primary cases are probably permanently cured, while the generalized ones will, in a large percentage of cases, require further prolonged and intensive treatment.

Victoria has delegated its City Council to forward a communication explaining the city's proposition to the federal government regarding the consolidated military hospital scheme. The city has offered the Elk Lake area to be used as a site for the proposed central hospital, free of charge, together with free water, for so long as it may be required for hospital purposes, the loan to extend until two years after the expiration of the war. The Hon. Martin Burrell, Secretary of State and British Columbia's representative in the Cabinet, has addressed a letter to Mr. Hannington, the city solicitor who has acted for the Council in the negotiations, stating that there was no possibility, as far as he knew, in any contingency, of moving the present hospital establishments at Esquimault and Resthaven.

THE PREVENTION OF WAR NEUROSES

By Thaddeus Hoyt Ames, M.D.

Instructor of Neurology, College of Physicians and Surgeons; Assistant Neurologist, City and Volunteer Hospitals, New York City

CERTAIN facts established by medical officers I desire to bring to your attention. The war neuroses do not occur in regiments under certain medical officers or line officers; nor do they occur in soldiers who have severe wounds or severe organic disease; nor in prisoners of war; nor in all of the soldiers exposed to shell explosions. Furthermore, these neuroses do occur not only in soldiers who have been in action, but also in soldiers who have not been overseas.

It is evident that running through these diverse conditions there are some factors which tend to prevent the development of neuroses. It is the purpose of this paper to discuss the factors which tend to avert neuroses—that they may be developed for the benefit of soldiers individually and collectively.

At first glance it would seem that the removal of prisoners from the zone of exploding shells would account for the absence of neuroses, but the evidence of like neuroses in soldiers who have never been overseas, or who have not been in action, indicates that distance from danger does not prevent their development. In other words, it is not necessary, first of all, nor eventually, to stop the war in order to prevent neuroses.

Efforts on a large scale have been made in recent years for the elimination from armies of men whose constitution makes them unfit for service. Individuals who are insane, or who have ever been insane, psychopathic individuals, constitutional defectives, and men who for six months immediately prior to enlistment have been incapacitated from work because of a neurosis, are exempted from service. Men who have chronic neuroses, and who have not been incapacitated six months prior to enlistment, although in previous years they may have been away from work for a great many months are accepted for service. This systematic procedure

Presented at the combined meeting at Hamilton, May, 1918.

keeps undesirables from getting into the army. There still remain the tasks of preventing the incapacitation of men who are already neurasthenics on admittance to service, and of preventing the development of neuroses in the average normal soldier, and in the high-grade, intelligent officer, to both of whom there are so many opportunities after mobilization for maladjustment.

Theoretically discipline tends to control men. Soldiers and officers are put through a training calculated to dominate them so completely that even under stress of adverse circumstances they would react in an habitual way. In other words they are taught adjustments beneficial to service, but their training is directed more to their bodies than to their spirits. Military writers on the science of war have lamented the lack of definite instruction of officers and soldiers in the development of *morale*. The management of emotions has always been left to the individual line officer who has himself had no formal instruction in dealing with the rise and fall of morale either in individuals or in troops. As a result soldiers and officers are carried along by routine and sheer force, and are treated by the system of reward or punishment according as they are contented or discontented, more intelligent or less intelligent, normal or neurotic; or in other words, according as their behaviour is a good adjustment of a maladjustment. Obviously army training and discipline were never intended to be particularly beneficial for nervous soldiers nor systematized to the end of preventing nervous breakdowns. Discipline actually compels adjustments rather than prevents maladjustments.

There are reasons for believing that there can be preventive measures on a large scale. Before Pearce Bailey's book, "Accident and Injury," came out in 1898, there were a great many patients every year who claimed damages from railroads for functional nervous symptoms following railroad accidents. Through the agency of this book, not only patients and doctors, but lawyers and the general public came to know that people were not entitled to functional nervous symptoms just because of accidents, and now traumatic hysteria is practically a thing of the past. War neuroses are but varieties of traumatic neuroses; if one form can be eradicated, so can another form.

There is evidence immediately connected with the war. On their return from France, some Canadian soldiers and officers with whom I talked at length, told me that they believed they would have avoided their symptoms of nervousness if they had only been told by some understanding person that the fear they experienced

was nothing to be ashamed of, and had they been helped to regain their self-confidence or self-esteem. They stated that they thought there would be definite benefit to the army from straight talks to soldiers about fear.

A line officer returned to Canada after having spent many months at the front, on being asked about his experience with nervous symptoms in soldiers, told me that he had heard of their existence in the army but that none of his own soldiers had broken down; he considered that it would be a personal disgrace if soldiers broke down under his charge. C. B. Keenan, Lieutenant-Colonel, C.A.M.C., told me that he believed that if soldiers were managed properly there was no need for them to be disabled with nervous symptoms.

There is a story of one of the clearing stations in France where the medical officer in charge said: "Hello, here are twenty cases of shell shock from the —— regiment. We have not had any shell shock from that regiment for six or eight months. I wonder if they have changed medical officers." On inquiring he found that the medical officer who had been in charge was away on furlough and that after a strange officer came on duty there immediately developed these twenty cases of neuroses.

D. K. Henderson, Captain, R.A.M.C., was in New York this winter after having spent six months as battalion medical officer at the front, following an experience of ten months at the Lord Derby War Hospital in caring for large numbers of nervous soldiers. When I asked him about the difference in symptoms of cases when they got to England from those at the front, he said that it had been a great surprise to him, but that not one of the men under him, in the six months that he was battalion medical officer, developed a neurosis. He stated that he was on the look-out for these cases as he was interested in them, but that although his soldiers were subjected to the same stimuli which the soldiers in the Lord Derby Hospital stated had incapacitated them, his soldiers had not broken down.

Not only is it theory that the war neuroses can be averted, but it is certainly fact that certain officers have actually avoided them. If measures on a small scale can be successful, so can measures on a large scale.

Let us see now what is done by these line officers and medical officers who avert incapacitating neuroses. First of all they carry out the army regulations existing in all countries directing them to look out for the welfare of their men. They look after the physical

comfort of their men by arranging for blankets, sleep, and food, and make the soldiers feel that they are really interested in their well-being. They consider their troops to be made up of individuals, and in their personal contact with them, discriminate between different kinds of men, using judgement in dealing with them. Some captains make a point of being able to call privates by their nicknames and of knowing their family stories. Most of the higher officers consider it an impossibility to know intimately every private, but they expect the lieutenants, and particularly the sergeants, to have a pretty careful knowledge of every private. In this way they make subordinates feel that they are considered as individuals and not as mere cogs in a machine. These officers know, too, that privates and stretcher-bearers are connoisseurs not only of officers' leadership but also of the morale of individuals. They find that bets are made as to which men are going to break down, and just how soon these particular men will be sent back of the line with the so-called shell shock. This knowledge, gleaned as it is from more or less inaccurate and unscientific sources, is nevertheless valuable enough, they consider, to be investigated. An officer then has the opportunity of passing down the line to make observations for himself or of summoning the candidate.

The line officer rather than the medical officer has the first opportunity for this first aid to a man whose behaviour is noticed to be different than usual. It is necessary, first of all, to tide this man over his immediate stress, and later to relieve him altogether of his discomfort. The soldier is ordered to fill sandbags or to do even unnecessary work that has been devised for the occasion. If work alone isn't sufficient to steady his nerves, he is placed between two veterans who are instructed to look out for him, or he is kept in tow by the line officer himself. One officer told me that he did not allow a certain nervous soldier out of his reach for several days until the fellow was steady enough to manage himself alone. Keeping a man busy is but a mechanical means of transforming his emotions from one kind to another; talking to a man is another means. It does not matter temporarily what means is used, provided the reaction proves progressive rather than regressive.

An officer criticizes a trembling soldier for some trivial fault, planning to arouse not shame, but a desire to make amends. He goes down the line chatting casually with a nervous soldier, discussing affairs at home, until in a twinkling the soldier recovers his self-possession. To a man who has tears in his eyes he gets off a joke that produces a hearty laugh, and to the next soldier who is

hesitating about going over the top, he gives an unexpected jab with his bayonet, causing the soldier to let out an angry curse until he turns around surprised to find the officer there. This anger which superseded the hesitation is quickly replaced by chagrin and then by a desire to make good in the eyes of his beloved officer. This officer goes on down the line. He shouts to a surly chap, "Why the hell don't you get on your job?" and in the next breath, he whispers to another, "I'm scared, too, but I'm not going to quit, are you?" Now he comes upon a soldier just excavated from a heap of dirt following a shell explosion. He looks at the man on the ground; no medical office is near, so he quickly manipulates the arms and legs and finds that no bones are broken and that there is no oozing blood. He helps the soldier to his feet and says, "Well, old top, they didn't get you after all. You'll be all right in two minutes. I say, Tommy," addressing the nearest man, "you get busy fixing this trench and have this fellow help you." And as the officer comes back through the line a little later he finds the man, who had been blown up, again at his post, slaps him on the back and says, "Well, I'm glad they didn't get you. You're all right now, aren't you?" and leaves him comforted, and determined to get even with the Hun. Rarely has this officer found it necessary to say to a man, "If you don't carry on, I've got a bullet for you."

If at the end of the day the officer hears that one of these men is still unsteady, he hunts him out or sends for him and demands, gently or abruptly, as is best suited to the soldier, "Come now, tell me, what is it that is *really* troubling you?" And then he gets the story that something has gone wrong at home, that he is discontented with trench life, is afraid, or is fed up with the whole show. Patiently the officer listens, and talks in a way that is not too fatherly, too friendly, nor too authoritative, until the soldier leaves calmed, ready for the future. The officer goes to sleep feeling not only that he has steadied the soldier, but that by preventing the soldier's collapse, his own reputation was saved from disgrace.

No person is ever subjected to such an unleashing of primitive emotions as is a man in the service, and if ever one needs help in managing his emotions it is in time of war. The brunt of the management of soldiers falls to the line officers, and that of the officers to higher officers, but that part which relates to the health naturally should and does revert to the medical officer. Soldiers are more open to suggestion and are more likely to be impressed by the advice of the medical officer than are civilians by a physician, because men in uniform are trained to the habit of accepting without question the statements of those in authority.

Soldiers know, too, from their experience in earlier life that a physician comes into a personal rather than a business relationship with them, and they prefer, when their emotions are upset, to deal with a medical officer rather than with a line officer. They expect a physician to understand their mental as well as their physical ailments.

Now a medical officer does not actually come in as close contact with troops as the line officer, and yet the troops all know him and what he stands for. Soldiers find out very quickly whether the medical officer is going to treat them as human beings, or is going to assume *a priori* that all soldiers are "swinging the lead". They know from the talk that disseminates from nervous soldiers who have been on sick parade, whether they can trust a medical officer with their personal problems.

Some medical officers realize the situation. They know that they cannot talk to each soldier separately, but they also know that the morale of the troops may be the morale of the neurotic soldier who comes in complaining at sick parade, and they take particular pains to keep that neurotic contented at his post. They know that the neurotic is the soldier who spreads talk, and that good advice given him is going to reach many others. In addition, some medical officers have a system of talking to line officers, non-commissioned officers, and particularly to ringleaders among the privates about the relationship of emotions to health, in order that they may in their conversations with others use his authority as physician in giving out this information. For, as Napoleon said, it is not just before battle, but at the camp fires, that there can be the greatest effect of a speech to soldiers.

The information that writers on military science say is necessary for the development of morale can perhaps be supplied by the medical officer in his instruction about the control of the emotions and their relationship to health.

With the idea of preventing soldiers and officers from breaking down with neuroses, the medical officer can discuss their management under two main heads—discipline and education. Discipline implies the domination of an individual. When a superior does not acquire the domination of an inferior he uses force, severity, threats, and even punishment until the inferior is seasoned to taste. As the neurotic individual *ipso facto* submits to discipline less satisfactorily than a normal person, the superior increases his force, severity, threats and even punishment, expecting to get the desired results. The medical officer can explain that

although this method may tide a nervous soldier over some immediate stress, it can but serve to aggravate the soldier's nervousness, and will, if repeated, be likely to precipitate a complete breakdown. Discipline is so indispensable to military success that it cannot be relaxed for the sake of the candidate for nervous collapse. However, without the use of severe measure, by a process of education the soldier can be brought to the point of believing that discipline is a form of coooperation between officers and men, to which he willingly lends his aid until there is perfect teamwork.

The second method is by training the mental faculties. The training of the body for military tactics as regulated by the army is alone insufficient for the prevention of neuroses. Mental training should go along with physical training in order that soldiers and officers can be as prepared to deal with the emotional as with the physical side of military life. Just as the education of the soldier includes the expectation of being in battle, or of having wet feet, so can it include the expectation of being in situations which will arouse hatred, anger, jealousy, sexual feelings, and strongest and worst of all, fear. They can be taught to expect strong instincts and emotions to which they will not have a chance to react in the appropriate way. With this advance training they will not be caught unawares and unprepared.

They can be prepared to be harassed by the Hun until the fighting instinct arouses them to anger or hatred, and yet not be allowed because of military orders, to react to the emotion by fighting. They can be prepared to be in situations in which a creative instinct or a parental instinct arouses them to keen desire to take individual courses of action intended for the welfare of others and the State, and yet not be allowed because of military orders to be more than a cog in the machine. Soldiers can be prepared to expect strong sexual emotions when military orders interfere with the getting of gratification.

Soldiers can be told that accompanying any strong emotion regardless of its nature are symptoms of one kind or another, such as the rapid beating of the heart; jerky breathing; a change in the blood supply, such as paleness or flushing of the skin; perspiration; feeling of fainting and weakness in the head, abdomen, or in the legs; trembling; an increased desire to pass urine and fæces, or even loss of control of those functions. The presence of any or all of these symptoms does not at all mean that the soldier has any organic disease. The soldier with strong emotions is entitled to symptoms

and need not be alarmed about his physical state if he finds that his heart thumps, or that he loses control of his bowel movements just as he is about to go over the top. When a person fully realizes that there is no relation of the symptoms of emotions to the symptoms of organic disease, he no longer worries about himself.

It often happens that a soldier obtains satisfaction through some other instinct than the one that is aroused, as for instance, a private's fear leaves him altogether when he is given the responsibilities of a sergeants: or a soldier's fear ceases when he gets satisfaction for his fighting instinct by coming into hand to hand conflict with the Hun, or a soldier's fear is removed by the diversion of football or other sports.

Soldiers can be taught to anticipate having their personal tendencies or desires frustrated by military orders, but they can be taught also that the advantages to the State of having a perfect discipline are also advantages to the soldiers themselves in giving them a protection which they could not have if they yielded to their own impulses. Soldiers can be made to understand that sacrifice of their personal desires is in reality not a curtailment of their getting satisfaction out of life, but the best means of preserving their own lives under conditions of war.

When military orders interfere with the obtaining of satisfactions of emotions once started, and appropriate responses cannot be given to them, attempts to suppress them only serve to aggravate the symptoms, as in the case of a man whose symptoms become increased when he cannot extricate himself from danger and when he tries to hide his fear. Any emotion ought to be recognized and dealt with rather than suppressed, particularly if it is repugnant to or incompatible with one's ideals. Frequently difficulties arising in soldiers, and especially in officers, are due to the fact that the expression of fear is repugnant to the ideals of patriotism and duty. Fear in a man urges him to get out of danger, and his ideals tell him to be steadfast and worthy of the name good soldier. Fear makes a man say to himself, "God, I'd like to get out of this," and at the same time his ideals for patriotism and duty say, "Steady, old man, carry on." A war between fear and ideals is carried on inside the soldier, until he, ashamed of himself because he does not possess that bravery which he thinks should be the first quality of a soldier, considers himself an inferior creature, and suddenly finds himself in the midst of a neurosis.

The medical officer can give assurance that fear is a normal, healthy reaction to the presence of danger when one cannot get

away; that fear may be a matter of good judgement; that fear comes to every one, at some time or other, except to the insane man, and in some degree, the liar; and that fear may be acknowledged openly and frankly without any more shame of criticism than one would have in talking of anger or hatred. Soldiers suffering from war neuroses and soldiers suffering from gunshot wounds, with whom I have talked, all expressed the greatest relief when they found that they could discuss their fear without being criticized or made to feel ashamed of themselves, and they told me that they believed every man would be a better soldier if he could go through his experience with fear, and come out of it without feeling remorse and shame. If soldiers can be relieved of their self reproaches for having fear, they will no longer have that conflict in their minds which is the forerunner of neuroses.

Another point in the education of men in service is in connection with the instinct of self-preservation. Although men with fear are not taken out of danger, men with neuroses are. A neurosis is an agent which brings a man back of the line. Just as soldiers are glad to have blighties in order to get to a place of safety, so soldiers are glad to have neuroses to get to a place of safety. Despite the disadvantages of suffering there is a distinct asset in having a war neurosis in that it keeps one out of the danger zone. The open discussion of this phase of the sickness will tend toward the elimination of neuroses, but it will also tend toward the open discussion of the relation of fear to ideals, so that soldiers and officers will all realize that the existence of fear need not interfere with one's being patriotic or fulfilling duty.

All soldiers need to have help at some time or other in keeping up their confidence. Soldiers like to have constant assurance that their superior officers, the mates of their own rank, their subordinates and the civilians at home are each and every one imbued with the idea of doing their bits well and conscientiously. Then they feel confidence in others. More than confidence in others, soldiers need to have self-confidence. And only when soldiers feel their own ability to cope with the problems that reach them from home, with those that come up in military life, and with their own emotions, do they feel confidence in themselves. Lack of self-esteem is one of the worst enemies to an individual. It develops from so many causes that intelligent help from an unprejudiced officer is necessary to remove it. The development of self-confidence is necessary to the good morale of the individual; the absence of self-confidence is a symptom of a neurosis.

A soldier always recognizes in his officer a willingness to help. He quickly knows which line officers and which medical officers feel a personal responsibility for the safety, comfort and health of their men. Similarly officers are quick to sense a feeling of responsibility on the part of subordinates for their share in the Big Show, and medical officers recognize the co-operation of soldiers and line officers in their participation in hygienic measures for general benefit. The complete training of officers and soldiers includes the development of a sense of joint responsibility in which the medical officer makes use of every prophylactic measure known to his science for the health of the soldiers, in which the line officer acts as both a father and mother to his soldiers, and in which the soldier considers that his country's cause is his cause and his country's fight his fight.

In other words, when there exists a feeling of joint responsibility, the individual disregards his own interests in favour of those of others. If each individual feels responsibility for others and for the cause, there will be an decreased liability to incapacitating emotions or to neuroses.

Without self-esteem and self-confidence an individual will not be able to assume his own responsibility toward himself and others. Without assuming responsibility the individual will not have self-esteem. With a knowledge of the effects of emotions on health, and of the means for dealing with emotions, men can have increased self-confidence and a sense of joint responsibility, and willing readiness for discipline. When all these factors are developed in good proportion the officer or soldier carries on and does not break down.

Editorial

THE PRESENT EPIDEMIC

UNDER the name of "Spanish Influenza" an epidemic is sweeping over the North American Continent, more especially the eastern states and provinces of the United States and Canada, with an alarming morbidity and mortality. It is a rapidly spreading and very contagious disease which involves particularly the respiratory tract, but is associated with marked constitutional disturbances and prostration. It is said to have made its appearance first in Spain, hence "Spanish Influenza." It seems to have spread over the Continent and England where it still claims many victims. But it appears from the testimony of reliable medical witnesses that the disease in England is of a relatively benign type.

Its advent on this side of the Atlantic is of recent date. Here, as in other countries, the disease appeared prominently and severely from the start amongst soldiers, where it has been responsible for a high mortality. It appears from what reliable records are so far available that clinically, two types of cases occur—first, the simple non-pneumonic infection, secondly, the severe and frequently fatal, pneumonic type. This latter is a very dangerous, rapidly progressing, septicæmia with high fever, a curiously slow pulse, often running an erratic course, which may kill in a surprisingly short time. Between the two is no absolute separation; type 1 may either quickly or sometimes after days develop into type 2, and then rapidly lead to death. It may therefore be supposed, and this is practically the safest course, that in this, as in other epidemic diseases mild infections may, on translation into other individuals,

give rise to severe ones. It is noteworthy that the severe type affects with predilection young, strong and plethoric individuals, especially men. In them the prognosis is most unfavourable and the disease rapid. As regards the nature of the disease and the anatomical and bacteriological findings no definite final statement can as yet be made. Cases which have come to autopsy show generally a marked, diffuse, severely hæmorrhagic pneumonia, so that the lungs appear in recent state in extreme red hepatization, although the consolidation of the lung may not be complete. It is associated in practically all cases with marked sero fibrinous pleurisy. Involvement of the lung is frequently bilateral. Cases in which a more typical broncho-pneumonia occurs are much rarer. The larger bronchi and the trachea are also usually intensely reddened and inflamed, and occasionally may even show a croupous membrane. The throat, tonsils, and larynx are free. In addition to these lesions, autopsy shows the general results of marked septicæmia.

Bacteriologically, the cases appear to be mostly mixed infections. In the majority of cases the pneumococcus, in one or another strain, is recovered from bronchi, lung exudate, and pleural fluid. A number of cases also show influenza bacilli. The frequency of this finding, however, varies amongst various observers, and the proof that the bacilli found are definitely of the influenza variety has not always been furnished beyond doubt. Besides these two organisms various forms of strepticocci contribute to the flora of the lesions. This is not the place to enter into a detailed discussion of these findings and their significance. Further, careful study is necessary before definite conclusions can be announced especially as to why the disease assumes in the present form such a malignant character. It may be that a symbosis of several pathogenic micro-organisms such as influenza and pneumonia enhances the virulence of both.

One more word as to specific treatment of the disease. As might be expected the disease had not been long with us

in this country when announcements in the Daily Press of sera and vaccines appeared. These should be received with a great deal of reserve by the practitioner. In the first place, it has already been stated above that the nature of the infection as well as its extreme virulence in many cases is still obscure. In the second place it appears that most of these cases are mixed infections in which more than one micro-organism is concerned. Thirdly, even if it is taken for granted that the most important factor of this infection is the influenza bacillus, not much hope can be entertained in establishing immunity or cure by influenza vaccines, for the influenza bacillus has only feeble protecting qualities and stimulates but very feebly to anti-body formation, so that the agglutinative properties of the blood in influenza are not much more marked than in normal blood. Moreover, what little protection influenza vaccine furnishes is extremely slow in development; and finally, it is very doubtful whether in the human being any immunity is conferred by influenza infection. False hopes should therefore not be entertained by practitioners and laity that vaccine treatment is going to be of much help in this epidemic. On the contrary, it might even be that, if the vaccine be introduced into a patient ill with the virulent septicæmic type, aggravation of the disease might occur by exposing a body already swarming with dead and living bacteria to a further dose.

THE TREATMENT OF WOUNDS

THERE has been no greater field for advance in Medical Corps work than in the treatment of wounds. The sanitary personnel has done excellent work, but their good results were rather expected from the advances made in public hygiene during the last decade. To those who have seen the wounds caused by the modern missile, at the time hey are produced, with foreign matter introduced in nearly

all cases, it has never been surprising that weeks were necessary before even a slight wound could be healed and the soldier returned to the line. In spite of this, wonderful results are being now got by excision and cleaning and by giving to-day the assistance that will be needed to-morrow.

Not until the last two years has much progress been made, but in that time a really phenomenal change has taken place. The good results being got now, as compared with two years ago, show us how hopelessly deficient the early surgeons were in the treatment of infected wounds. Surgery had abandoned to a great extent the antiseptic methods of Lister for the aseptic technique of the modern abdominal surgeon. The great minds were looking for new fields to conquer in the abdomen, chest, and head, with the result that the traumatisms of civil life were delegated to the juniors or even in many cases to the house-surgeon to look after.

Although we must acknowledge that surgery was caught napping at the commencement of the war and that the fight against the ravage of infection went hopelessly against them, with gas gangrene taking a terrible toll of lives and limbs; still the victory was short, as the surgeons rose magnificently to the occasion, although the difficulties were enormous. To combat the situation there was a wild scramble for antiseptics to remove and destroy the bacteria. The Carrel-Dakin, Wright's saline, the salt pack, B.I.P., Flavine and various chlorine derivatives have all their ardent followers and some their enemies. The comparative value of the different methods is to say the least still controversial. All of them have sufficient value to remove the sting of our early defeat.

The report on another page of this number by Lieutenant-Colonel Crile is interesting in several different ways. The team work in this unit exemplifies one of the great advantages the military has over the civilian hospital. The presence of a full time staff under the direction of a single chief, while

dangerous at times by throttling initiative, allows for definite experiments such as this on a large number of cases. As this is really a new field of surgery they have rightly given the younger men an equal share with the older. Undoubtedly this is a good procedure for both the patient and the surgeon.

The fact that twenty-five per cent. (one hundred and eleven out of four hundred and twenty) of infected wounds were treated successfully by primary or delayed suture would seem incredible to the surgeon of a few years ago, especially when one takes into consideration that the infection had been running rampant for nearly two days and a half. These were the worst cases too, as one third of the admissions had been put to one side as either medical cases or ones in which the wound was progressing satisactorily. That this success was due to the surgeon's knife rather than any particular antiseptic is apparent from a study of the charts. The fact that this was an emergency method must not be lost sight of. With fewer cases and more time to devote to each undoubtedly better results would be secured and a far higher percentage would be successfully treated by primary or delayed suture.

THE terrible increase of tuberculosis in Belgium is forcing itself upon the attention of the world. Already a large portion of the population is in the grip of the White Plague. Many of the children of the cities, and in industrial centres, are in incipient stages of consumption. Malnutrition and exposure engender a physical condition which cause many thousands to become an easy prey to the disease. A type of organization existing before the war has been amplified and transformed, and is now effectively combatting the menace to Belgium's next generation. It was known as the "*Foyer des Orphelins*", formerly, but with the support of the Belgian Relief Commission it was possible to remodel the association into the "Orphanage and Anti-Tuberculosis

League". This is directing its energies to protecting the young from the disease and restoring, where possible, those already afflicted. Unfortunately many of the institutions connected with the League have reached the limit of their accommodation and resources, and find it hard to accept limitation when so many more children are in dire extremity. An increase of 6·4 per thousand in the number of deaths, and a decrease of 8·5 per thousand in the number of births is revealed by a comparison of statistics compiled in Belgium in 1913 and figures secured by the Belgian Relief Commission at a recent date. The birth rate drops more swiftly as the days pass, and the toll of death swells with stupifying rapidity. A systematic policy of extermination has been ruthlessly pursued by Germany, and amongst the multitude of her awful crimes she presents to the world that stupendous tragedy, the childhood of a nation deliberately sacrificed.

The American Red Cross has sent out from National Headquarters, Washington, a widespread appeal to the medical profession and the country generally. Surgeon-general Gorgas has called for a thousand nurses a week; and 25,000 graduate war nurses must be in war service by January 1st. It is estimated that before next July the demand will reach 50,000.

The fifty American hospitals representing service in France have been notified by the surgeon-general that they may invite a limited number of their student nurses to complete their training in base hospitals abroad, where they can have the privilege of rendering service at the same time. This action is the result of advices received from the Medical Department headquarters of the American Expeditionary Forces. Although many of the hospitals desired the permission suggested, until word had been received from overseas no action was taken by the authorities in America. The pupils selected will be enrolled in the Army School of Nursing; each unit of twenty-five will be in charge of a graduate nurse.

Chicago is becoming a disciple of the scientific method of handling crime. This method is making its way slowly but surely. The founding of the psychopathic laboratory was the first step. In early days the law presented the chief obstacle to the scientific treatment of crime. Some of the prosecuting attorneys refused to read the reports which the psychiatrist made to the judges on the plea that these reports weakened their arguments. This attitude has changed; conscientious lawyers now often bring their clients and even some of their witnesses to the laboratory.

There is a form of insanity which renders a man almost certain to commit crimes of violence. Such cases convinced Chicago that the prevention of crime is a scientific problem. Many criminals are in some way mentally defective; a large percentage of mental defectives are potential criminals, and may develop the most dangerous tendencies. Many cases are on record of a man sentenced by the court for a petty offence which has caused his arrest; after serving a few months he has been turned loose on the community, a potential murderer who soon became an actual one. Society can protect itself against the damage and expense of crime only by identifying and isolating these defectives who make up approximately two per cent. of the population. Judge Olson's crime laboratory, once ridiculed, is now supported by public opinion and has the co-operation of the police and the lawyers. Chicago is meditating the establishment therefore, of a colony in which insane criminals may be placed on indeterminate sentence, and which will be the necessary complement of the laboratory where they are identified.

Obituary

DR. J. MILTON COTTON

Dr. J. Milton Cotton, one of Toronto's foremost surgeons, died on August 11th, from a sharp attack of heart failure. He had been suffering from overwork for some time and on the advice of his colleagues entered Wellesley Hospital to recuperate, where it was thought a month's rest would fully restore him. His wife predeceased him about six months ago.

Dr. Cotton was among the best known of Toronto's medical men, and held many degrees from English as well as local universities, and in addition had been coroner for York County for the past twenty years. He was born on August 12th, 1860, in Simcoe County. He received the degree of M.D. from Toronto University, and in 1883 those of L.R.C.P. from Edinburgh University, and M.D., C.M. and M.R.C.S. from Victoria University, England. Locally Dr. Cotton had many activities; he was a member of the Academy of Medicine, Toronto; a member of the International Congress of Medicine and Surgery; a member of the American Medical Association and a member of the Clinical Surgeons of America.

But it was in his own city that Dr. Cotton was best known and widely esteemed. For fifteen years he was senior surgeon of Grace Hospital, and many in his extensive private practice testify to his unfailing kindness, his generosity, his consideration. The great and the lowly, the rich and poor, the young and old, all, in every walk of life, mourn the passing of a fine humanitarian career.

Dr. Thomas Cullen, died on September 14th, at Baltimore. He was silver medalist of Toronto University in 1890, and from 1892–1896 was associate professor of gynæcology at Johns Hopkins University.

The death of Dr. S. E. C. Muirhead, formerly of Vancouver, took place on July 23rd, at Kingston, Jamaica, where, owing to

failing health, he went expecting the change of climate would be beneficial.

Dr. Sylvester L. Freel, M.D., died recently at his home in Stouffville after a brief illness. He was in his seventy-eighth year, the oldest active practitioner throughout York County.

Dr. Walter Norman Brown died at his residence, 375 Spadina Road, Toronto, on August 30th.

Dr. S. T. Macadam, of Battleford, died at that town on the August 23rd. He was one of its oldest citizens having settled there just after the rebellion. His work as Indian doctor brought him a great deal in touch with the Indians and the wide district to the north, where he will be greatly missed.

Dr. W. G. Hutt, for twenty years a practising physician of Newmarket, Ontario, died suddenly on August 18th.

Correspondence

E. Melbourne, Australia,

August 21st, 1918.

To the Secretary,

Canadian Medical Association, Montreal,

Dear Sir: I have been directed to inform you of the dispute which has been in existence for some months between the Friendly Societies of Victoria and the British Medical Association.

The lodge doctors have been paid for the past forty years on an average as little as 14/- per annum for the town; this includes attendance upon the member and his family and works out at four persons for each payment; for the country the average is 16/- per annum per member for the lodge doctor.

For a considerable period of time we held negotiations with the associated lodges called the "Friendly Societies Association" with a view to having the rate of remuneration increased. As the Friendly Societies refused our demands 100 per cent. of the town members and 96 per cent. of the country members of the British Medical Association on October 31st last gave three months notice of their intention to resign their appointments on January 31st of this year and asked for reappointment on the terms of a Model Lodge Agreement which had been drawn up. The Friendly Societies Association refused our terms and established institutes at which the institute doctor was asked to attend from 3,000 to 5,000 patients. The government of the day was asked by the Friendly Societies to take a hand in settling the dispute, and after eight months' time a royal commission, presided over by a judge, was established to inquire into the merits of the dispute. The commissioner found that the terms asked for by the British Medical Association were just and equitable. Both sides expressed their willingness to accept the finding of the royal commission but the British Medical Association made it a condition that the institutes which had been established should be abolished. They were unwilling to see their men sacrificed for their loyalty to the association in that they had tendered their resignations and were to be left without any means of livelihood should the commissioner's finding be accepted unconditionally.

The lodges are endeavouring to extend their institutes but find a difficulty in procuring medical practitioners. One of our most bitter opponents, the late president of the Friendly Societies Association, Mr. Samuel Mauger, is now on his way to Canada, and it was stated in parliament that he purposes securing 1,000 medical men from America to fill the positions of lodge medical officers vacated by the members of the British Medical Association in what was termed by the commissioner to be "a just demand". The institute doctors are ostracised by other members of the medical profession and are not met in consultation.

My Council would esteem it a favour if you would put a "warning notice" in your JOURNAL advising any medical practitioners in your country who might think of applying for any of the positions which might be advertised in your daily newspapers that they should first of all apply to yourself for information.

By the same post I am forwarding a marked copy of our Journal setting forth the finding of the Royal Commission.

Yours faithfully,

C. STANTON CROUCH,
Secretary.

To The Editor of THE CANADIAN MEDICAL ASSOCIATION JOURNAL.

Sir:—In the September issue of the JOURNAL, there appeared an article on "The Returned Soldier", by Lieutenant-Colonel W. T. Connell, C.A.M.C. In this paper he voices some stringent criticisms of the Board of Pension Commissioners, on the grounds that they seem to have abrogated to themselves an autocratic power in the business of awarding pensions to men disabled on service, and to have disdained the assistance of the Board of Medical Officers on Discharge, so far as the estimation of the pensionability of the soldier is concerned.

His main contention is that the Board of Officers who see the man, is better able to determine his pensionability than the Pensions Board, who only see a written description of the man, can possibly be.

This argument obtains by its plausibility a force which it lacks in accuracy. The error of the assumption lies in the failure to appreciate two facts of supreme importance.

1. Pensions are awarded for disabilities or losses of normal abilities, and not for the injuries or diseases which have caused such loss.

2. The reasons for awards must be stated in clear and unmistakable language; they must be in the possession of those empowered to make awards; they cannot, under the Pensions Regulations, be made on the ground that some one, however well qualified, expresses the opinion that they are justifiable, unless the reasons for such opinions are clearly stated.

The Board of Pension Commissioners is most anxious at all times to profit by the advice and assistance of those who are mainly occupied with the treatment of war injuries and diseases. Information regarding the correctness of the award of pension, in specific cases, is sought by every possible means.

The whole effort of the Board is directed to the task of awarding such pension as the disability justifies and of assuring the award of equal pensions for equal disabilities.

I am, your obedient servant,

J. M. Biggar, Lieutenant-Colonel, C.A.M.C.
Assistant Medical Director Board of Pension Commissioners.

Ottawa, October 10th, 1918.

The following communication has also been received from the Canadian Pensions Board:—

The matter of pensions for our disabled sailors and soldiers is attracting a considerable amount of attention at the present—perhaps more than that to which it is essentially entitled.

The problem of the rehabilitation of our men on discharge has not as yet been entirely elaborated, and, except in so far as the awarding of pensions is concerned, has not gained much public recognition. It is easily understood, therefore, why pensions, which after all play only a small, and in the final survey, an unimportant rôle in the plan of rehabilitation, have acquired temporarily an undue prominence.

The Government has decided that $600.00 per annum is the sum necessary at present to keep in "decent comfort" a man, unable by reason of the injuries he received on service, to contribute to his own support. The Pension Regulations require the Board of Commissioners to decide, without any reference to previous occupation, the proportion of this sum which shall be paid to those whose disablement on service has reduced them below the normal in the pursuit of employment.

In obedience to this instruction many men have been awarded what seem to be very small sums of money for disabilities, which

on superficial examination appear to handicap them very seriously so far as their employability is concerned. One hardly need quote the case of the unfortunate watch-maker who, wounded in the right hand and therefore unable to return to his former well-paid occupation, received from a grateful country the noble sum of $10.00 a month.

The reason for the not uncommon failure by the uninstructed properly to assess the value of such an injury, results from the fact that it has not been considered in relation to several thousand similar cases. To judge from a single individual such as the one quoted, is obviously unscientific, and yet, so far, is the usual procedure. When several thousand cases of a similar nature are investigated, it is found that by comparison with men totally incapacitated, the handicap is generously estimated at one fifth.

We are all prone to consider individual cases along lines somewhat like this: He did his bit (a most horrible phrase). He is unable to earn his living as he used to. He should, therefore, be compensated for the loss of his livelihood. He gets an absurd pittance. What is the matter with the Pensions Board?

A conclusion such as this evidences a complete ignorance of the Pension Regulations and a failure to appreciate that the apparent but not real injustice should not be laid at the door of the Pensions Board. Any cases of error of real insufficiency in award of pension should be reported to the Board, whose whole effort is to the provision of lawful and proper pensions to every one who is suffering from a physical detriment due to his service.

We should look at the matter from a broad and scientific standpoint. We should remember that there are a very large number of other trades than watch-making, to which our unhappy friend may turn, and in which he will, in spite of his disablement, as soon as he settles down, be able to support himself very comfortably. We should realize that our duty as physicians and surgeons is not finished when we have, through the exercise of our professional skill, brought a war injury or disease to its irreducible minimum.

Thoughtless agreement with the views of the apparently ill-used pensioner adds materially to the difficulty of the main task, which consists in renewing in the patients the courage and initiative, which they, as a whole, have displayed so admirably in service and, in stimulating them to the exhibition of these qualities on their return to the business of citizenship. In this way we shall best be assisting toward the solution of the tremendous problem of rehabilitation.

Retrospect of Literature

THE SPLEEN AND ANÆMIA. Experimental and Clinical Studies by RICHARD MILLS PEARCE, M.D., Sc.D., professor of research medicine, with the assistance of EDWARD BELL KRUMBHAAR, M.D., Ph.D., assistant professor of research medicine, and CHARLES HARRISON FRAZIER, M.D., Sc.D., professor of clinical surgery, University of Pennsylvania.*

THE appearance of this book is one of the events of the year in clinical and scientific medicine. By a wise combination of forces, the conclusions upon the relation of the spleen to anæmia, which have been arrived at through the admirable experimental and metabolic researches carried out in recent years by Professor R. M. Pearce and his Associates into the effects of splenectomy upon the blood and blood-forming organs, iron and nitrogen metabolism, and fat utilization, have been made introductory to a discussion of the clinical features of the various types of non-infectious splenomegalies and the therapeutic applications of splenectomy (Krumbhaar), as well as to a graphic presentment of the successive steps in the surgical procedure of this operation (Frazier). The information presented in the first portion of the book marks a definite advance in our knowledge of the function of the spleen in blood destruction and regeneration, and this is made ancillary to the discussion of the indications for, and method of, removal of the organ. The work thus sets a standard for the clinical application of knowledge gained by scientific laboratory methods to the problems of the bedside, and from this point of view alone it is of immense value. In addition, its clear description of the methods of technique followed in the various investigations made, comprehensive charting of data, well-balanced and truthful conclusions, and thorough presentation of the literature, make it an indispensable laboratory handbook, which is already on the shelves of almost every advanced worker on the problems of blood and immunity on

*419 pages, 16 illustrations in colour, black, and white. Cloth, $6.00. Published by J. B. Lippincott Company, Philadelphia, London, and Montreal, 1918.

this continent, while the clinical facts it presents upon the obscure subject of the splenomegalies and anæmias and the therapeutic possibilities of splenectomy make it of equal value to the surgeon and to the general practitioner as well. It is well illustrated by coloured micro-photographs as well as drawings, and is completed by a rich bibliography.

The book is in three parts, by the respective authors. Part I.—*Experimental Studies by R. M. Pearce*, occupies the first two hundred pages. A historical survey in the first chapter shows that the spleen was removed from the normal animal without untoward effect upon life as far back as Morgagni, and that since the year 1875 splenectomy has been recognized as in itself, harmless, the prognosis being greatly improved under modern surgery and since its abandonment in leukæmia, in which disease it is absolutely contraindicated. The effect of splenectomy on the red cells is the main object of the experimental study, and in this connection the following facts are definitely established: (1) the occurrence of an anæmia of the secondary type, of gradual development and return to normal in six to twelve months; (2) an increased resistance of the red cells to hæmolytic agents; and (3) a decreased tendency to jaundice and hæmoglobinuria. The supposed regulatory influence of the spleen on blood destruction and regeneration is studied in the light of these facts. The experiments were done uniformly under ether anæsthesia. Removal of the normal spleen was carried out on dogs in whom thorough blood examinations and metabolic determinations had been made both before, and repeatedly after operation, and the effects of changes of diet and of hæmolytic agents upon splenectomized and non-splenectomized animals compared. The controls studied included not only the normal animal, and animals rendered anæmic by other methods than splenectomy, but animals in whom the spleen had been cut out of the portal circulation by other methods than splenectomy, such as ligation of the splenic veins or displacement of the portal vein. A special series of investigations were also directed to changes in the bone marrow and lymphnodes and to the microchemical distribution of iron. The findings of Warthin on hæmolymphnodes, and of Asher to the effect that the spleen has an influence on iron metabolism, were not confirmed. Definite conclusions upon the causation of the changes in the red cells were not reached, but it is evident among other things that the absence of the spleen itself is a factor in the causation of the anæmia following its removal, owing apparently to the fact that it elaborates a hormone which stimulates the bone

marrow to blood regeneration and which is activated in its passage through the liver, and a functional relationship of the spleen to the liver, as yet not understood, is suggested. The fatty marrow of the long bones is found to be usually replaced, some six months after splenectomy, by a red hyperplastic marrow rich in iron pigment, and the lymphnodes and liver capillary cells of splenectomized dogs which have been given hæmolytic poisons are crowded with endothelial cells phagocytic for red corpuscles, suggesting that, in the absence of the spleen, these structures assume a greatly increased rôle in blood destruction. The direct formation in the liver of bile from hæmoglobin, in which process the spleen is proved to be merely a mechanical factor, the lack of any share of the spleen in iron or nitrogen metabolism, the increase of the anæmia in splenectomized dogs kept on a cooked diet, suggesting the presence of a vitamine in this organ, are a few more of the suggestive principles elucidated. A comparison of the rather scanty literature of the findings in normal human subjects after splenectomy reveals a similar anæmia to that found experimentally in animals, thus presenting a sharp contrast to the blood crises seen after removal of the diseased organ, when the withdrawal of its toxic products evidently gives an impetus to active repair. The tenth and last chapter of Professor Pearce's contribution consists of a valuable discussion of the metabolic studies made before and after splenectomy in two cases, one of congenital hæmolytic icterus, and the other of pernicious anæmia. Only three other such studies of splenectomy have been published previously, two in Banti's disease and one in pernicious anæmia, making a total of five complete studies of metabolism before and after splenectomy in the literature to date.

Part II.—*Clinical observations by E. M. Krumbhaar* presents for the first time, in the words of the preface, "the modern views concerning the classification, diagnosis and treatment of the non-infective splenomegalies characterized by blood-destruct on," and is full of practical information of direct clinical value. The detailed clinical and pathological observations given are supported by excellent coloured pictures showing the minute structure of the spleen, methods of value in diagnosis and prognosis are discussed, and special laboratory tests for determination of the resistance of red cells, evidences of bone marrow activity as shown in reticulated cells, nucleated forms and platetets, presence of agglutinins and hæmolysins in the blood serum, urobilin excretion, protein, uric acid and iron metabolism are described. The value of splenectomy as a therapeutic procedure is considered in the light of the literature.

Splenectomy is especially indicated in congenital hæmolytic jaundice and is also followed by definitely favourable results in Banti's and Gaucher's diseases. In cirrhosis of the liver, malaria, and syphilis, it is sometimes of value. Its use in pernicious anæmia is made the subject of a special study, and one hundred and fifty-three cases in which it was done are tabulated from the literature. Here it is to be tried only in favourable cases, that is in patients before the fifth decade of life, where the disease has not lasted too long and in whom the anæmia is not aplastic nor associated with spinal cord symptoms. It should be preceded by repeated transfusions, and by the removal of all points of infection such as oral sepsis.

Part III.—*Surgical Treatment of Lesions of the Spleen by Charles H. Frazier*, gives full details of the preparation of the patient for splenectomy, of the operation, and of the after care. It is illustrated by excellent drawings showing the successive steps in the operative procedure.

MAUDE E. ABBOTT

Miscellany

News

NOVA SCOTIA

THE medical profession of Halifax answered the urgent call of the State of Massachusetts for assistance to fight the spread of Spanish influenza by sending at once a detachment of nurses and doctors, which was immediately acknowledged by Governor McCall who wired a letter of thanks to the Lieutenant-Governor.

The arrangements for the erection of the tuberculosis hospital in Halifax are nearing completion, and the work is expected to begin immediately.

PROFESSOR FRASER HARRIS has completed the history of the medical aspect of the great disaster at Halifax, N.S., December 6th, 1917. The manuscript is in the hands of the Halifax Relief Commission; it is hoped that the work will be published by the Federal Government.

Dr. Blackadar, of Port Maitland, Yarmouth County, delivered a very forceful address at the opening of the Maritime Education Convention in which he sounded a warning that if present unsanitary conditions were allowed to persist they will be sufficient to criminally accuse educational authorities. He gave statistics showing that 90 per cent. of tuberculosis in the adult is contracted before the age of fourteen. He strongly urged the teachers of rural schools to enforce a dust campaign in the schoolroom.

NEW BRUNSWICK

The Jordan Memorial Hospital has passed into the hands of the Invalided Soldiers' Aid Commission. The federal authorities decided that it would be best to take over the institution, and have taken a five year lease of the hospital with the privilege of renewing if they so desire. In the agreement it is stipulated that the civil patients placed there by the province shall be looked after by the invalided soldiers' commission at a maximum charge of $15 per week. It is probable that at the conclusion of the war the hospital will pass under entirely federal control. The Jordan Memorial Sanitarium was presented to the province by Mrs. J. Clarke Jordan who, in a letter of recent date, states she is quite willing the soldiers should have the institution.

QUEBEC

The result of the Final Primary examinations of the Pharmaceutical Association are as follows: passed as Licentiate Pharmacy in order of merit, six; passed as Assistant-Pharmacist, in order of merit, five. The examiners were Messrs. Omer St. Amour, Ste. Agathe des Monts; A. R. Farley, Hull; O. H. Tansey, Montreal; A. E. Francœur, Quebec; M. Letourneau, L. S. Desautels, J. E. Barnabe, president, and J. H. Pilon, secretary-registrar, Montreal.

The Department of Militia and Defence has, in co-operation with the St. John Ambulance Brigade, made arrangements for the establishment of a Woman's Aid Department (W.A.D.) for work in the several military and convalescent hospitals throughout the Dominion. This department will be organized in three divisions: (1) V. A. Division: (a) V.A.D. Nursing Services; (b)

V.A.D. Trainers. (2) Special Service Division: Masseuses. (3) General Service Division.

Each hospital will have a general service superintendent and larger ones an assistant superintendent.

At the general board meeting in September of the Victorian Order of Nurses, at Ottawa, the general superintendent gave a complete synopsis of developements of the work of the order. The map of the hospitals and nursing centres of the various provinces is fast becoming a veritable network of activity. Throughout Saskatchewan and Alberta new centres of work for the order are constantly being opened up, the most important step being the securing of the co-operation of the departments of public health in these western provinces. A fifty bed hospital will be erected at Melfort, and another hospital for twenty-five patients at Centre Butt, in each of which the V.O.N. will provide the staff and management.

ONTARIO

Circulars were sent out by the Ontario Board of Health to all the doctors containing all possible information regarding the treatment of Spanish influenza and the prevention of the spread of the epidemic in the province. In response to an appeal of the American Red Cross of Boston for nurses to assist in caring for the victims of the outbreak a large party of nurses left Toronto immediately.

One central board of health for the border cities is now being advocated by the medical fraternity of the various municipalities, and an active movement is now on foot to bring about the amalgamation of the different boards of health, and thus simplify the work. Legislation authorizing the centralization of the work must first be obtained before the present system can be changed. The consent of the municipal councils must first be obtained and then the government approached to grant the necessary sanction. One central office and one medical health officer, it is advocated, would enable the department to be more efficiently and economically managed.

One of the features of the report of the Provincial Board of Health for August is reference to the serious outbreak of typhoid

fever in Chatham and Kingston. The report also refers to tuberculosis and mentions that fifty-six municipalities reported one hundred deaths. Venereal diseases are also far too prevalent in the province it states. Nine of Toronto's city hospitals have sent their pupil nurses for lectures to the University. This is a new departure; formerly these lectures have been given by staff doctors at the individual hospitals, but it has been found increasingly difficult to supply doctors. The new system will standardize the theoretical teaching given in the training schools. The Toronto Chapter of the Canadian Association for nursing education, composed of superintendents of hospitals and training schools is responsible for the change. The lectures given by superintendents and instructresses will still be continued.

THERE will be accommodation for over one thousand soldier patients in the city building formerly occupied by the National Cash Register Company. Before the end of the year the changes will be completed. It will be the central military orthopædic hospital for all Canada.

AT the request of the Red Cross authorities in Toronto the citizens of Prince Rupert devoted a day to the collection of sphagnum moss and forwarded a full car load to the city, to be used in making dressings for the wounded men at the front.

DR. F. R. MILLER recently delivered at Hart House, Toronto University, a course of lectures on "The Physiology of the Human Nervous and Muscular Systems". The lectures were attended by the medical officers who are studying the treatment of the paralyzed soldiers.

DR. J. R. SHANNON has been elected surgeon-in-chief of the Manhattan Eye and Ear Hospital, New York. He was formerly of Kingston, Ontario.

DR. N. H. BEAL, associate professor of surgery of the Western University Medical School, has been granted a leave of absence for a year while acting as an assistant at the Mayo Clinic, Rochester, Minnesota.

BRITISH COLUMBIA

THERE were 1,322 patients in the provincial Mental Hospital at the beginning of August and 1,339 at the end of the month, during which time sixty-three were admitted, seven returned from probation, nine were discharged, six died, and seven escaped.

The Balfour Sanitarium for the treatment of pulmonary tuberculosis has been changed from a military to a civilian hospital. In every respect the work will be carried on as before only all military routine will be avoided. At the present time Captain Olson is on indefinite leave of absence from the C.A.M.C. and is acting in a civilian capacity at the Sanatarium as the medical superintendent in charge.

VANCOUVER despatched an anti-tubercular exhibit, the property of the city, in charge of two nurses, to the Jubilee Fall Fair of the Cowichan Agricultural Society held at Duncan recently. Arrangements were made for the holding of a mass meeting during the fair, at which illustrated health lectures were given. Dr. Young, secretary of the provincial health board, gave an address on hygiene.

DR. C. DENTON HOLMES, medical health officer of the Saanich School Board, has tendered his resignation owing to pressure of work in connection with the Invalided Soldiers' Commission.

ARMY MEDICAL SERVICES

THE following have been placed on Reserve of Officers from the personnel of the C.A.M.C. for civilian duty as stated:

Board of Pension Commissioners: Lieutenant-Colonel J. L. Biggar, Victoria, B.C.; Major D. McLaughlin, Calgary, Alberta; Captain B. F. Keillor, Dundee, Ontario; Captain A. E. Hilker, Hamilton, Ontario; Captain E. H. Orok, Winnipeg, Manitoba.

Invalided Soldiers' Commission: Major E. E. Latta, Colborne, Ontario; Captain G. W. Howland, Toronto, Ontario; Captain G. G. Stewart, Camrose, Alberta.

C.A.M.C. Appointments: Lieutenant-Colonel D. McGillivray (Toronto) has requested to be relieved of his duties on the Board

of Consultants. He is to be replaced by Lieutenant-Colonel Parsons (Surgeon to the Sick Children's Hospital), Toronto.

Colonel K. Cameron becomes O.C. St. Anne de Bellevue Military Hospital. Lieutenant-Colonel C. E. Doherty becomes A.D. M.S. at Victoria, B.C. Lieutenant-Colonel J. A. Grant, P.A.M.C. is appointed to the Board of Revision, Ottawa. Lieutenant-Colonel J. M. Gunn becomes D.A.D.M.S., Calgary, Alberta. Captain C. M. Prett becomes D.A.D.M.S. (Sanitation) at St. John, N.B. Captain E. H. Young becomes O.C. Ontario Military Hospital, Cobourg, Ont. Captain G. W. Armstrong assumes command of the A.M.C. Depot at Toronto. Captain G. D. Gordon assumes command of the Petawawa Camp Hospital. Major C. E. Fortin becomes officer in charge of Venereal Disease, Winnipeg. Colonel F. S. L. Ford for duty at Militia Headquarters, Ottawa. Major R. L. Miller becomes D.A.D.M.S. at Victoria, B.C. Colonel L. E. W. Irving replaces Lieutenant-Colonel Ryerson as A.D.M.S. at Toronto. The latter retires to assume his duties at Toronto University. Lieutenant-Colonel McVicar becomes Senior Physician at Spadina Military Hospital. Lieutenant-Colonel O. A. Cannon replaces Lieutenant-Colonel Grant as A.D. M.S. at London. Major J. J. Ower becomes Pathologist to Ste. Anne Military Hospital. Captain H. R. Mustard becomes D.A. D.M.S. (Hospitals) at Vancouver. Lieutenant Edward Mountjoy Pearse, C.A.M.C., has been appointed for duty with the Victoria Military Hospital. Lieutenant Campbell Davidson, C.A. M.C., has been appointed for duty at Qualicum Military Hospital.

Dr. J. Mair Robertson will cease to be a member of the Medical Board Centre, Vancouver, B.C.

Major H. V. Coates, C.A.M.C., will cease to be attached to the Vancouver Military Hospital for duty and will perform the duties of Sanitation Officer for the Vancouver Military area.

The following medical officers have been appointed to proceed with the Canadian Siberian Force: A.D.M.S., Colonel J. T. Clarke, C.A.M.C. D.A.D.M.S., Major T. Morrison, C.A M.C.

16*th Canadian Field Ambulance:* Lieutenant-Colonel C. A. Warren, Majors G. A. Winters, W. M. Carrick, Captain C. A. Marlatt, Lieutenants S. A. Wallace, W. G. Bowles, M. C. Adamson, G. C. Kenning, H. W. Elkington, H. E. Skeete, R. R. Struthers, Captain W. J. Warden (Q.M.).

11th Canadian Stationary Hospital: Colonel J. L. Potter, Major F. A. Cleland, Captains F. J. Scully, J. F. C. Colling, J. H. Box, G. L. Sparks, W. T. Kennedy, A. M. Savoie, G. H. Lansown, N. Morin, J. Race; Lieutenants J. M. Munro, H. C. Connell, H. H. Potts; Captain H. Barratt (Q.M.).

Regimental Medical Officers: Captains J. L. King, H. R. Holme, V. H. McWilliams, A. J. Shilistra, W. R. Scott, W. G. Shepherd, L. M. Stuart, C. W. Moore.

Sanitary Section: Captain H. W. Lewis.

Returned from Overseas: Colonels F. G. Finley, L. E. W. Irving, Lieutenant-Colonels Biggar, Parsons, J. C. Meakins, T. A. Starkey, C. S. McVicar; Majors W. Creighton, J. J. Ower, A. J. Losier, H. B. Jeffs; Captains A. B. Greenwood, H. C. Pearson, W. E. Struthers, C. L. B. Stammers, J. W. McIntosh, W. R. Coles, G. H. Wade, A. A. Drinnan, E. C. Beer, G. A. Campbell, W. V. Jackson, T. B. Green, W. A. Hutton, L. W. Houghton, and F. W. Jackson.

Promotions Overseas: Major-General G. L. Foster becomes Director General Medical Services, O.M.F.C. Colonel A. E. Ross becomes Brigadier-General and D.M.S., Canadian Section at G.H.Q. Majors J. M. Nettleton, S. R. Harrison, D. A. L. Graham, C. Hunter become Lieutenant-Colonels. Captains A. B. Schinbein, J. E. Campbell, A. Blais, H. O. Boyd, H. W. Wookey.

Promotions: To be Colonel—Lieutenant-Colonel J. A. Gunn, Winnipeg; Majors W. A. Gardnor, P. K. Menzies, E. V. Hogan, W. M. Hart, T. H. MacDonald, W. H. K. Anderson, N. B. Gwynn, H. H. Moshier. To be Major—Captains F. W. Tidmarsh, R. Pearse, J. J. Thompson, R. L. Miller, T. Morrison and A. J. Swan.

Captain Harry Whytock, C.A.M.C., was invested with the Military Cross by the King recently, at Buckingham Palace.

Nursing Sister Bessie Mitchell was decorated by the King with the Royal Red Cross. Nursing Sister May Whittaker was decorated with The Order of the British Empire, and also honoured by having her name appear in the Birthday List.

The Military Cross has been awarded to Captain John Gagen Lee, now of the Imperial Army, formerly of the C.A.M.C., and the bar to the Military Cross to Captain George McTavish, and the second bar to the Military Cross to Captain Clarence Young, both officers of the Imperial Army, but formerly of the C.A.M.C.

THE Military Medal has been awarded to G. Broderick, C.A.M.C., and to R. Forrester, C.A.M.C.

THE following names have been brought to the notice of the Secretary of State for War for valuable services rendered: Lieutenant-Colonel W. H. Delaney, C.A.M.C.; Lieutenant-Colonel P. G. Goldsmith, C.A.M.C.; Lieutenant-Colonel (A.-Col.) L. E. W. Irving, D.S.O., C.A.M.C.; Lieutenant-Colonel K. D. Panton, C.A.M.C.; Colonel S. H. McKee, C.A.M.C.; Majors C. A. Young, S. C. Chown, C.A.M.C.; Captains C. R. Wilson, J. R. Goodall, (A.-Maj.), C.A.M.C.; other ranks, S. Sergts. (A.S.M.) F. Alden, G. K. Gray; Sergeants (A.-S. Sergeants.) H. Caunce, E. F. Hitchman, W. Hope, A. S. Roddick, W. R. Townsend, Q.M.S. (A.S.M.), F. J. Sainsbury, Pte. S. M. W. Lawler; all of the C.A.M.C.

CASUALTIES

Killed in Action

CAPTAIN T. FLECK GRAHAM, C.A.M.C., of Brantford, Ontario.
S. STREET, C.A.M.C.

Wounded

LIEUTENANT-COLONEL ERNEST RAYMOND SELBY, C.A.M.C., of Bradford.

LIEUTENANT-COLONEL A. S. DONALDSON, D.S.O., C.A.M.C., of Brockville, Ontario.

CAPTAIN J. MAYNARD, C.A.M.C., of Hamilton.
CAPTAIN W. C. MORGAN, C.A.M.C., of Arden, Ontario.
CAPTAIN J. E. BARRY, C.A.M.C., of Toronto.
CAPTAIN ALBERIC MARIN, C.A.M.C., of Montreal.
CAPTAIN S. E. HOLMES, C.A.M.C., of Crystal City, Manitoba.
CAPTAIN H. G. YOUNG, C.A.M.C., of St. Mary's, Ontario.
CAPTAIN A. M. BLAKELY, C.A.M.C., of Chatham, Ontario.
DR. J. WHITHAM, of Regina (in the combatant forces).
SERGEANT HUBERT STEPHEN, C.A.M.C., of Montreal.
BYRON F. PARSONS, C.A.M.C., of Montreal.
W. A. IRWIN, C.A.M.C., of London, Ontario.
W. A. SCOTLAND, C.A.M.C., of Erskine, Alberta.

Book Reviews

THE ERRORS OF ACCOMMODATION AND REFRACTION OF THE EYE AND THEIR TREATMENT. A HANDBOOK FOR STUDENTS. By ERNEST CLARKE, M.D., F.R.C.S., ophthalmic surgeon to the King George Hospital, etc. Fourth edition, 231 pages. Price, 6s. net. Publishers: Ballière, Tindal & Cox, 8 Henrietta Street, Covent Garden, London, 1918.

Mr. Clarke's little handbook deserves the fourth edition which it has now reached. The work is sound and clearly written, and can be cordially recommended as an introduction to the subject of which it treats.

Books Received

THE following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

HYGIENE FOR NURSES. By NOLIE MUMEY, M.D., lecturer in hygiene, chemistry, and bacteriology, Logan H. Roots Memorial Training School. 151 pages, 75 illustrations. Price, $1.25. Publishers, C. V. Mosby Company, St. Louis; McAinsh & Co., Ltd., Toronto, 1918.

NURSING IN DISEASES OF CHILDREN. By CARL G. LEO-WOLF, M.D., chief of Clinic for Sick Babies and Children for the Health Department of the City of Buffalo, N.Y. 305 pages, 72 illustrations. Price, $2.50. Publishers: C. V. Mosby Company, St. Louis; McAinsh & Co., Ltd., Toronto, 1918.

Surgical and War Nursing. By A. H. Barkley, M.D., M.C., F.A.C.S., lecturer at Good Samaritan Hospital Training School for Nurses. 201 pages, 79 illustrations. Price, $1.75. Publishers: C. V. Mosby Company, St. Louis; McAinsh & Co., Ltd., Toronto, 1918.

The American Hospital of the Twentieth Century. A treatise on the development of medical institutions, both in Europe and in America, since the beginning of the present century. By Edward F. Stevens, architect, member of American Institute of Architects. 274 pages, illustrated. Architectural Record Publishing Company, New York, 1918.

A Text-Book of Physiology for Nurses. By William Gay Christian, M.D., professor of anatomy, Medical College of Virginia, and Charles C. Haskell, M.A., M.D., professor of physiology and pharmacology, Medical College of Virginia. 163 pages, illustrated. Price, $1.75. Publishers: C. V. Mosby Company, St. Louis, 1918.

Anatomy of the Human Body. By Henry Gray, F.R.S., fellow of the Royal College of Surgeons. Twentieth edition, thoroughly revised and re-edited by Warren H. Lewis, B.S., M.D., professor of physiological anatomy, Johns Hopkins University, Baltimore. 1246 pages, illustrated; with 1247 engravings. Price, $7.50 cloth, $9.00 leather. Publishers: Lea & Febiger, Philadelphia and New York, 1918.

Concerning some Headaches and Eye Disorders of Nasal Origin. By Greenfield Sluder, M.D., clinical professor and director of the department of laryngology and rhinology, Washington University Medical School, St. Louis. 272 pages, 115 illustrations. Price, $7.00. C. V. Mosby Co., St. Louis; McAinsh & Co., Limited, Toronto, 1918.

The Wassermann Test. By Charles F. Craig, A.M., M.D., Lieutenant-Colonel, Medical Corps, United States Army. Published with authority of the Surgeon General, United States Army. Illustrated with coloured plates. 239 pages. Price, $3.00. C. V. Mosby Co., St. Louis; McAinsh & Co., Limited, Toronto, 1918.

MILITARY SURGERY OF THE ZONE OF THE ADVANCE. By GEORGE DE TARNOWSKY, M.D., F.A.C.S., surgeon to Cook County and Ravenswood Hospitals, Chicago. Illustrated. Price, $1.50. Publishers; Lea & Febiger, Philadelphia and New York, 1918.

PREPARING FOR WOMANHOOD. By EDITH B. LOWRY, M.D., 175 pages. Price, $1.00. Publishers: Forbes & Company, Ch c-ago, 1918.

A TREATISE ON CYSTOSCOPY AND URETHROSCOPY. By GEORGES LUYS, M.D., Paris, translated and edited by ABR. L. WOLBARST, M.D., New York. 217 illustrations, 24 chromo-typographic plates and 76 original drawings. 386 pages. Price, $7.50. C. V. Mosby Co., St. Louis; McAinsh & Co., Limited, Toronto, 1918.

LABORATORY METHODS OF THE UNITED STATES ARMY. Compiled by the Division of Infectious Diseases and Laboratories Office of the Surgeon-General, War Department, Washington. Price, $1.50. Publishers: Lea & Febiger, Philadelphia and New York, 1918.

Medical Societies

THE ALBERTA MEDICAL ASSOCIATION

THE thirteenth annual meeting of the Alberta Medical Association was held in Edmonton from September 25th to 27th at the University of Alberta. The attendance was the largest on record, eighty-five having registered, in addition to which, a number of visitors were present.

In addition to the papers presented, which were of exceptional value and interest, the Association was favoured during the convention by the attendance of Lieutenant-Colonel Starr and Lieu-

tenant-Colonel Wilson, of the C.A.M.C. Consultant Board, both of whom made very interesting addresses on war surgery. Lieutenant-Colonel Gunn of Calgary also gave an address on Implements, Offensive and Defensive, showing a great variety of war trophies, at the dinner tendered the delegates by the Edmonton Rotary Club. The public meeting was addressed by Dr. Stewart of the Ninette Sanitarium on Tuberculosis, which meeting was also briefly addressed by Mayor Evans; the Hon. George P. Smith, Minister of Education; Hon. J. R. Boyle, Attorney General and Hon. A. J. Mackay, who has recently been appointed Minister of Public Health.

The President, Dr. D. G. Revell, delivered his address at the dinner given by the Edmonton Academy of Medicine, and in this address called attention to some very important matters which call for serious consideration. (This address will appear in a later issue.)

Dr. A. Fisher, superintendent of General Hospital, Calgary, and Dr. T. H. Whitelaw, M.O.H., Edmonton, were elected representatives to act on the editorial staff of the CANADIAN MEDICAL ASSOCIATION JOURNAL in response to the resolution passed by the executive council of the Canadian Medical Association recently at the Hamilton meeting. Many important matters, including the Alberta Liquor Act, were discussed, and the resolutions resulting therefrom will be sent to the JOURNAL for publication at a later date.

The following papers were read: "Charlatanism," by John Park; "Child Welfare," by Mr. Bishop, Secretary Child Welfare League of Alberta; "Acidosis," by J. B. Collip; "Some Recent Advancements in Internal Medicine," by H. C. Jamieson; "Results in *X*-ray Therapy," by C. H. Malcolmson; "Glioma of Brain," with "Reports of Cases and Exhibits," by G. A. Anderson; "Diagnosis of Diseases of the Nervous System with Notes on Cases," by A. Fisher; "Obstetrics in Recent Literature," by Dr. Duncan; "Induction of Labour at Term," by F. W. Gershaw; "Curettage, a Dangerous Procedure," by W. A. Lincoln; "Summary of Seven Years' Medical Inspection of Schools" by D. J. Dunn; "Tuberculosis of the Kidney," by E. Allin; "Clinical Significance of Blood in the Urine," by J. S. McEachern; "Goitre Surgery and the End Results," by C. C. Tatham; "War Surgery," by Captain R. H. L. O'Callaghan; "Terminology in Medical Reports, Military Service," by Major J. A. Hislop; "Actino Mycotic Infections, with Case Reports," by

Lieutenant A. E. McCalla; "*X*-ray Findings," by Captain W. H. McGuffin; "Preventive Dentistry with Illustrative Slides," by C. F. Strong.

Calgary was selected as the place of meeting for 1919. Dr. G. A. Anderson of Calgary, is President-elect, and Dr. A. Fisher, of Calgary, secretary-treasurer.

Sir Alfred Yarrow, Bart., in 1916 offered his magnificent estate at Broadstairs, in Kent, to the Canadian Military Departmnet for the accommodation of their convalescents. With the return of the property to Sir Alfred last spring, after it became undesirable to keep the men there on account of the frequency of enemy air attacks on that coast, the following acknowledgement was sent by the Minister of Overseas Military Forces of Canada:

"On behalf of the Canadian Government and the soldiers of the Overseas Military Forces of Canada, I desire to take this opportunity of thanking you most heartily for your generous action in placing your beautiful home at the disposal of the Canadian Medical Services. . . . Under the name of the Yarrow Canadian Convalescent Hospital it gave accommodation to hundreds of wounded Canadians for well over a year. . . . They will take back with them a memory of kind hospitality in this country which should go far to maintain the good feeling which is so desirable between the Mother Country and the Dominions."

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Medical Association Journal

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A REPORT ON THE EFFECT OF HIGH CARBOHYDRATE FEEDING ON THE NAUSEA AND VOMITING OF PREGNANCY

By James W. Duncan, M.D., C.M.
Lecturer in Obstetrics

AND

Victor John Harding, D.Sc.
Associate Professor in Biological and Physiological Chemistry, McGill University, Montreal

SIMPLE, moderate and pernicious nausea and vomiting have long been a serious menace to the pregnant woman, and a persistently difficult matter for the medical practitioner to combat. For many years strenuous efforts have been made, both from the laboratory and the clinic, to understand the causes which underlie this most distressing and sometimes serious condition, and thus to remove the treatment of it from the realm of empiricism. Among the many workers in this field on this continent, one may mention Williams, Ewing, Stone, Murlin, Slemons, Chipman, D. J. Evans, and De Lee. So numerous, indeed, have been the attempts in this direction that it would almost seem superfluous to present to the world another contribution on this subject. We have, however, attempted to approach the general subject of the toxæmias of pregnancy from a new angle. We deemed it advisable and instructive to investigate the very mild and almost innocuous types of early nausea and vomiting instead of the more aggravated and serious conditions which usually are the subject of study in this

field. We felt that, in this way, it might be possible to disentangle perhaps one or two factors which compose the clinical picture in its serious aspects. We deal in this paper with the types of toxæmia known, in its milder form, as "simple nausea and vomiting" or so-called "morning sickness", and, in its severer form, as "pernicious vomiting". The relationship of the earlier toxæmias to those occurring later in pregnancy still remains to be elucidated, though there is a large amount of clinical evidence that an underlying connection exists between the two. We reserve our study of the later toxæmias from the standpoint expressed in this paper to a further communication.

Historical Review

Williams[1] was one of the first to classify the nausea and vomiting of pregnancy into types. He recognized three types: (*a*) Reflex; (*b*) Neurotic; (*c*) Toxæmic.

The first is relatively a very rare condition, the writers having met but three cases of incarceration of the pregnant uterus where vomiting was present, and at the same time we have met with the condition of incarceration twice, where pain and even threatened abortion was evident, with all evidence of vomiting absent. Even in the three first mentioned cases, vomiting and nausea was not relieved by correction. Evans* reports one case of severe incarceration with no nausea and vomiting. Chipman* further reports three cases occurring during the past year with no such accompanying condition. Reflex irritation may be a secondary factor in the development, but most obstetricians refuse to believe it to be a causal one. Appropriate obstetrical treatment in a condition of this kind would, of course, relieve its influence. In this same type of cases we have placed the so-called reflex irritations of a long narrow cervix, a rigid os and the influence of new growths.

The second or neurotic type was supposedly distinguished from the toxic type by a study of the ammonia-coefficient of the patient's urine. It might be as well to explain to those who have not been interested particularly in chemical terms that the term ammonia-coefficient is used to express the relation of the ammonia nitrogen to the total nitrogen in urine. Severe vomiting with a low ammonia-coefficient led to the diagnosis of a neurotic type; the toxæmic type was distinguished by a high ammonia coefficient. This view is

* Private communication

still maintained by its author, though not in its entirety, in spite of the evidence to the contrary, especially by Stone[2] and by Ewing[3] who independently showed that many cases of pernicious vomiting with a low ammonia-coefficient undoubtedly belonged to the toxæmic type.

We have been inclined, as a result of our investigation and its consequent results by treatment, to incorporate this second or neurotic type with the third or toxæmic type and to look upon the neurosis as an exhibition of a disturbance of the nervous system by the toxæmia. In support of this we would put forward the facts of our experience of over seventy separate cases of this condition and would draw your attention particularly to many cases where we had to deal with an absolute disinclination and even an antagonism to the continuation of the pregnancy. The neurotic element, without question, plays a large part as a secondary factor in these conditions, but in none of our cases could we allot to it a causal position. From this it will be apparent that we should prefer to place the nausea and vomiting of pregnancy solely under the one very general term of toxæmia.

The nature of the toxæmia is not by any means clear. That it could arise specifically from the fœtus or the placenta as a specialized toxin or toxic metabolic product seems hardly possible in view of the reported occurrence of pernicious vomiting in presence of hydatidiform mole. Nevertheless a vast amount of research has been carried out on such lines and many attempts have been made, with reports of cures, to develop an anti-toxin in the body of the mother. The serum of the non-vomiting woman, taken from her, more desirably in the puerperal state, during the first ten days post-partum, and injected into a patient suffering from this condition, has frequently been used. The very number, however, of these attempts, with reported successes and then reported failures, leads one to regard with suspicion the possibility of the solution of the problem by this method of attack, and we do not, in this report, intend to review this particular phase of the literature.

The recent developments of the physiology of the ductless glands and their connection with the sexual organs, combined with their pronounced effect on metabolism, naturally has led to an investigation of their effect upon the pregnant state. Foulkrod[4] and Ward[5] claim splendid results from the administration of thyroid extracts. Placental extract has many advocates for its efficiency. Extract corpus luteum and adrenalin also have been enthusiastically recommended and endorsed by many admirers. Personally we

have occasionally tried these, empirically it is true, but have found them of very doubtful assistance.

The theory of intestinal putrefaction products being the cause of pernicious vomiting was put forward by Dirmoser[6] who adduced evidence in its support. Without doubt, regularity of the bowel movement is an essential towards good health in pregnancy, even more so than in ordinary conditions, and no one doubts that intestinal putrefaction products may become a serious factor in pernicious vomiting, and, moreover, might even become an exciting cause in special cases. We have, however, many cases in our series where nausea and vomiting were present even to the pernicious type, although elimination by the bowel was proceeding normally. Furthermore, cases of uterine incarceration of such a marked degree as to bring about almost complete rectal obstruction do not necessarily cause nausea and vomiting. A case was reported to us by Dr. D. J. Evans, of Montreal, where a patient suffered from marked incarceration of the uterus between third and fourth month of pregnancy, to such an extent that the overloaded bowel was distincly palpable as a large tumor mass through the abdominal wall, and yet the patient at no time in the weeks preceding relief showed any signs of nausea or vomiting.

The maternal liver has also been prominently put forward as the seat of the trouble. Post-mortem examinations of that organ of patients dying of pernicious vomiting and of eclampsia have revealed very often an extensive degeneration of the fatty type. The similarity of the symptoms of pernicious vomiting with chloroform, arsenic, and phosphorous poisoning and the acute yellow atrophy of the liver in pregnancy have been emphasized time and time again.

Based on the nitrogen partition of the urine and the finding of a high residual nitrogen, Stone[2] put forward the theory of "suboxidation". He believed that the failure of the maternal metabolism lay in the inability of the liver to cope with protein in the normal way and that some protein escaped its normal destruction. In support of his views, he claimed to have isolated from such urines as showed a high residual nitrogen crystals of leucine and tyrosine.

Ewing and Ewing and Wolf[7] particularized the failure to destroy protein as a failure of deaminization of the amino-acids. They, too, found a high residual nitrogen, more especially in eclampsia, though they failed to corroborate Stone's crystals of leucine and tyrosine.

Murlin and Bailey[8] held similar views, but were, however,

unable to find any increased amino-acid nitrogen in the urine. This point was decided by Van Slyke and Losee[9], who, using the former's well known and accurate gasometric method for the determination of the amino-acid nitrogen in urine and blood, failed to find any increase in that fraction of the nitrogen in either fluid. The theories of Stone and Ewing are, therefore, to be abandoned. Van Slyke and Losee did find that eclampsia was distinguished by a low urea nitrogen, and that pernicious vomiting was alike "distinguished by a high ammonia-coefficient".

The significance of the high ammonia-coefficient in pernicious vomiting had, previous to the work of Van Slyke and Losee, been severely criticised by Underhill and Rand[10], who were disposed to ascribe the change in the urinary picture in that condition as due to mere starvation. Williams[11] combats that view in its entirety, citing cases where, after emptying the uterus and the cessation of vomiting had occurred, the ammonia-coefficient fell to a low value, although no food had been taken.

Acidosis has been put forward also as the cause of the toxæmia (Zweifel[12]). It has recently been shown, however, by Van Slyke and Losee that a general acidosis, as revealed by a depletion of the alkaline reserve, does not exist to a very pronounced extent. There is even in normal pregnancy, where all symptoms of toxæmia are absent, a mild degree of acidosis, which is perhaps slightly increased in pernicious vomiting, but in neither the normal nor toxic pregnancy does an acidosis exist to that extent found in nephritis or diabetes and of such severity as to account for the symptoms, except possibly in the last or comatose stages. The presence of acetone bodies in the urine has frequently been noted in cases of pernicious vomiting, but that these were the cause of the toxæmia was vigorously denied by Ewing, who, discussing the question from the general standpoint of acid intoxication, pointed out:

1. That acid intoxication, as evidenced by the appearance of ammonia and acetone bodies in the urine, occurs in many well investigated conditions without the appearance of toxæmic symptoms.

2. That the administration of alkalies (diabetes) and carbohydrates (pernicious vomiting) removes the evidence of acid intoxication from the urine, but leaves the symptoms (clinical) unaltered.

3. That acids have never been obtained from the blood in anything like the quantity required to produce the symptoms, while the administration of acids in large quantities is required to produce

the toxic symptoms in healthy animals, and even then these symptoms do not closely resemble those of the true toxæmias.

From this very brief review of the literature it will be seen that neither from the point of view of cause or cure has any satisfactory solution of the problem of nausea and vomiting or pernicious vomiting been arrived at. Rest in bed, forced fluids, attention to excreta, diet, and control of the nervous system by the use of mild and strong sedatives, appears to be the most commonly adopted procedure for this condition.

General Outline of Treatment

It is evident from the above review that no one theory has succeeded in accounting for the toxæmias of pregnancy, and it occurred to us, as no doubt it has occurred to many, that, although perhaps there may be behind the toxæmia one causal factor, the clinical picture is compounded of many factors and that the problem should be attacked by attempting to differentiate the several factors in the same individual. In this connection the study of the nausea and vomiting of pregnancy, especially in its earlier stages before the clinical picture has become complicated by too many secondary effects, should prove of especial value. The nausea of pregnancy, with or without occasional vomiting, either continual or intermittent, such as the so-called "morning-sickness", occurring at the very beginning of the pregnant period, is too frequently not regarded as a serious condition. Yet it is most certainly the precursor of pernicious vomiting, and its study should show some light on that vexed problem.

In connection with the milder or intermittent type, it is to be noted that the majority of cases show the symptoms as "morning sickness". The nausea or vomiting disappears during the course of the day only to reappear the following morning. This would appear to depend upon the presence or absence of food. Indeed, the treatment of this condition, we all know, is usually effected by attention to the patient's dietetic and hygienic habits, directed in a more or less vague and general manner. This would all point strongly to the presence of a metabolic factor and that, in the earlier and presumably simpler form of pregnant toxæmia, this factor was the dominant one.

Of the various metabolic factors, the one most susceptible to disturbance is well known to be that of the carbohydrate. In endeavouring to trace out how such a disturbance could take place,

the authors' attention was directed to the work of Imrie[13] and of Mottram[14]. The former has shown that the growing fœtus is greedy of unsaturated fat. The latter, that often in the pregnancy of nervous and ill-nourished animals, the liver becomes overloaded with fat, that is, there is increase of fat present, which has come in from the fat depots. Mottram has also shown that a simple hunger of a few hours' duration, in some animals, led to the same condition. The phenomena are more or less physiological in character, as the effect on the liver is a transitory one. It seemed possible then that these two factors, pregnancy and a short period of hunger, might account for the periodicity of morning sickness, and that the metabolic factor here concerned was a temporary relative lack of glycogen in the liver. Such a condition, it is well known, leads to a fatty infiltration of that organ.

Two things should follow from this view. Such a condition of the liver is usually associated with a acetonuria, accompanied generally by acetoacetic and oxybutyric acids, evidence of which should be found in the urine of these patients.

Such a condition is obviated by keeping present in the patient an adequate supply of carbohydrate.

We may say at once in all cases of nausea and vomiting in pregnancy which we have studied, except in two of the very mildest ones, we have found the acetone bodies present in the urine. Those cases where we found it absent were mild ones of morning nausea, but in these particular cases we were not able to obtain and examine the freshly voided over-night specimen which we wished. It must, at this point, be clearly emphasized that we do not regard the presence of acetone bodies as the cause of the nausea or vomiting. We regard them as a secondary result. Ewing's arguments on this point are conclusive.

As stated previously, the basis of our work has been an attempt to trace out the influence of the metabolic factor in this nausea and vomiting. Lack of glycogen in the liver, with its precursor, insufficient carbohydrate diet, was held to be a possible disturbing element in the early forms, and our success with carbohydrate feeding bears out this supposition.

As a source of glycogen for immediate treatment, we have used glucose, cane sugar, and lactose. The administration of large doses of cane sugar or glucose, over a protracted period of time, is, however, with many patients, a practical impossibility; the excessive sweetness in itself becomes a source of discomfort, if not an irritant. We soon had to fall back upon lactose as a practical convenience.

Here the use of lactose, either by mouth or rectum (in the more severe cases of vomiting) met with very encouraging results, and we may safely state that we have treated over seventy patients, representing nearly all grades of nausea and vomiting, from the mildest to the most pernicious type, in this manner, with the greatest success. None of our cases in the later period of their pregnancies developed eclamptic or pre-eclamptic symptoms.

It will, no doubt, be pointed out that many of these cases, especially those of the mild type, would have recovered without treatment. We are quite prepared to grant this, but possibly it would have meant weeks or months of discomfort, and even the danger of a progression towards the more dangerous point. Also we would state from the experience in our hands that by so keeping up the carbohydrate supply by this method, recovery has been most rapid, especially in the mild cases—a matter of a few hours. Furthermore, by continued observation and treatment, the patient in only two severe cases showed signs of a reversion. Five severe toxic vomiting cases, in whom, previously terminations of pregnancy had to be resorted to, were carried to full term and the delivery of a healthy child. One must note in passing that but two cases, in this series of over seventy, under this treatment gave a positive lactosuria test, when on a lactose régime.

The effect produced is not purely a psychological one. We possess instances of marked success in cases where the termination of the pregnancy was desired and sought, often, indeed, to the extent of the patient antagonizing every attempt to administer the remedy by mouth or rectum, it being necessary to resort to submammary injection of glucose. In spite of this, and although these instances occurred in severely toxic conditions, they were carried to successful issue at full term. One striking case of success against psychological influence was a primipara, who, having before her marriage been a nurse, read the prescription for lactose given her, and decided she was being given a harmless placebo. In spite of an antagonistic mental attitude, she took the remedy and a moderately severe vomiting, with continual nausea and anorexia, completely disappeared within forty-eight hours and did not trouble her again.

Also, we must lay stress on the fact that as soon as possible we have placed the patient on a high carbohydrate diet. The carbohydrate was drawn from mixed sources, and we have insisted upon a preponderance of fresh fruit and vegetables in the diet. We have not limited the patient to any great extent; we have, however, cautioned her strongly against excess of any one particular dish,

and have advised a very moderate use of such dishes as are high in fat content. In this category we have placed butter, cream, pork, salmon, etc., and we have done this merely as a precautionary measure to avoid, as far as possible, disturbances to the patient's digestive system.

We are aware that these results bring us into conflict with the experiments of Ewing[15], and Underhill and Rand[10], who, by administering glucose, sometimes in very large doses, failed to improve cases of severe pernicious vomiting. For the present, however, we wish to rest our case on the positive results we have obtained, but later we intend to present evidence that at any rate in some cases of pernicious vomiting the use of glucose alone is ineffectual.

In summarising our results in a general way, the following points are to be noted.

1. *We have proceeded on the assumption that in the early toxæmias of pregnancy the dominant factor is a metabolic one.*

2. *We have utilized the physiological results of Imrie and of Mottram to connect the fatty degenerated liver found in post-mortem examination of fatal cases of pernicious vomiting with the mild and moderate cases of vomiting.*

3. *We have assumed a temporary lack of carbohydrate supply.*

4. *We have found, in practically all cases of nausea and vomiting in pregnancy, the occurrence of the acetone bodies in the urine*

5. *We have endeavoured to correct the deficiency of carbohydrate supply by administering glucose or lactose, but mainly the latter, and supplemented this by a high carbohydrate diet.*

6. *In this way we have successfully treated over seventy cases of nausea and vomiting in pregnancy, including several severe cases of the pernicious type.*

Details of Treatment

We have in our experiments met with seventy cases of vomiting in pregnancy. These have been divided into three classes—mild, moderate and severe or pernicious—according to the severity of the condition as exhibited by clinical evidence. There is, of course, no sharp line of demarcation between the three classes. They merely represent convenient divisions to correspond with the grade of treatment.

Class I: *Mild type.*

Nausea was present in all, at least once daily, usually in the morning, though some also shewed a distinct nausea at night. There are forty-two cases in this class. Twenty-seven shewed nausea in the morning only: fifteen shewed nausea, with vomiting, twice daily. In this group also we have included cases of spasmodic nausea or vomiting, occurring not oftener than twice daily.

The presence of acetone bodies in the urine was demonstrated in all cases except two. As a test for acetone bodies we used the sodium nitro-prusside test which, as demonstrated by Harding and Ruttan[16], must be taken to indicate diacetic and oxybutyric acids, as well as acetone itself, and is extremely delicate. The treatment in these cases has been very simple, and the disappearance of the distressing symptoms has been very prompt. As far as possible the patient is advised to rest, demands of housekeeping are limited, and any exciting factors removed. Meat and fatty foods are eliminated from the diet and their place is taken by a liberal supply of carbohydrate food, such as potato, rice, oatmeal, vegetables and fruit. In addition, one to one and a half quarts of a 5 per cent. lactose solution are taken daily by mouth. The actual amount of lactose to use is determined by constant urine examination. With the first sign of lactosuria, the dosage is diminished. When the nausea and vomiting are fully controlled, the amount of lactose is rapidly cut down to about fifteen grams per day. The patient may rapidly return to ordinary diet.

All cases so treated recovered very rapidly, and were delivered at full term of healthy children.

Class II: *Moderate type.*

In this class we have included those cases where the nausea was continuous, or the vomiting more frequent than twice daily but not continuous. These cases also shewed some distinct sign of toxæmia, as, drowsiness, headache, furred tongue, nervous irritability, anorexia, constipation and decreased urine output. We have had seventeen of these cases under observation, and all of them shewed acetone bodies in the urine to a marked degree.

Rest in bed, with immediate correction of any excretory defects, is at once insisted upon in these cases. As in the mild type, protein and fat are taken from the diet, and carbohydrates forced as far as possible. One and a half quarts of a 5 to 10 per cent. lactose solution are given by mouth, if this can be tolerated. If not, this

solution is given by rectum, using a urethral catheter and giving very slowly ten ounces every four hours. The actual strength and continuance of the dosage are determined by the symptoms and the urinary findings. The treatment must not be pushed to the extent of causing lactosuria. As soon as possible the rectal administration is replaced by oral, and every effort is made to force carbohydrates in the diet, small quantities being taken at frequent intervals if desired. Proteins may be replaced as soon as the vomiting and nausea are under control. It is wiser, however, to defer the reintroduction into the diet of fatty foods.

All these cases terminated with favourable results to mother and child.

Class III: *Severe or pernicious type.*

In this group we have eleven cases of the most serious kind. The nausea and vomiting was continual and quite independent of any attempt to partake of food. In seven cases jaundice was apparent, and very marked in two of them. Four of them had the so-called coffee-ground vomitus. The urine of five of them shewed albumen and casts. They all of them shewed marked symptoms of toxæmia, one being in a state of semi coma when first seen. Severe epigastric pain was also marked in all of them.

Rest in bed, with complete isolation, is at once insisted upon. No attempt, however, is made to force any food at the beginning of the treatment. Any defective bowel excretion is corrected by enema, and the lactose solution administered by rectum as directed in the treatment of the moderate type of case. In case of disinclination or inability to retain the lactose enema, two hundred c.c. of a sterilized 5 per cent. glucose solution is injected under each breast. In those cases where this procedure has been followed, one injection has been found to be sufficient. As soon as possible rectal and finally oral administration of the lactose solutions are resorted to. As soon as the patient shews any inclination for food, small amounts of carbohydrate food are supplied at frequent intervals. The continuation of the treatment and the dieting then follow the course prescribed for the moderate and mild cases.

All eleven cases were carried to full term and delivered of healthy children, one of twins.

Synopsis of Treatment

1. Divide into three groups—Mild, Moderate, Severe.
2. Daily routine examination of urine—total quantity, acetone reaction, and its intensity, specific gravity, albumen, sugar, bile.
3. *Rest—*
   Mild cases—limit demands of housekeeping, etc.
   Moderate cases—rest in bed.
   Severe cases—rest in bed with isolation.
4. *Excretion—*
   Correct defects in functions of lung, skin, kidney, bowel.
5. *Diet—*
   Mild and moderate cases, eliminate proteids and fats for forty-eight hours. Force carbohydrates (fruits, cereals, fresh vegetables).
   Severe cases—absolute rest from all food by mouth for about forty-eight hours. Begin carbohydrates as soon as patient may be able to retain them. To be given frequently and in small amounts.
6. *Medication—*
   Mild cases—Lactose solution, 5 per cent., one to one and a half quarts daily by mouth.
   Moderate cases—Lactose solution, 5–10 per cent. one and a half quarts daily by mouth if possible—when not retained, this solution may be given by rectum, using a urethral catheter giving very slowly ten ounces and repeating every four hours.
   Severe cases—Sterile glucose solution, 5 per cent.—two hundred c.c., under each breast for one treatment, then use method of rectal injection of lactose.
   In both moderate and severe classes, the administration by mouth should be resorted to as soon as possible.
7. When the nausea and vomiting are fully controlled, the amount of lactose per day may be reduced to fifteen grammes, later this may be further reduced to a fifteen gramme dose triweekly. In all cases the reduction of the treatment or its discontinuance must be guided by an examination for acetone bodies and lactose in the urine.
8. Return to a diet mixed with protein may be made as soon as the nausea and vomiting are under control, but a return to the fats must be made more slowly.

Résumé of Results

In the mild and moderate cases the results from treatment along these lines were most gratifying. Complete and continued relief occurred in twenty-eight cases within forty-eight hours. Complete relief from vomiting, but with occasional returns of nausea, occurred in twelve cases. Many of the relapses we were able to trace to indiscretions in diet.

Two cases shewed a continual nausea with hyperacidity throughout entire pregnancy; both of these cases continued to full term with no graver symptoms developing.

In the moderate cases fourteen gave evidence of immediate and continued relief within one week of the installation of treatment. Three cases, however, were more stubborn and shewed some tendency to revert to the pernicious type. With more complete isolation in hospital wards, success was very speedily obtained.

In these mild and moderate groups it may be as well to state that in forty-six cases pregnancy had not advanced past the first ninety days before treatment was commenced; the remaining thirteen cases were between the third and sixth month.

In the pernicious group of eleven cases (seven primipara) the severe vomiting developed within the first one hundred and twenty days of pregnancy and only three shewed any recurrence in the later periods. It is also interesting to note that among the multipara, three had had previous pregnancies terminated for toxic vomiting, and two of them on two occasions, whereas all proceeded under this treatment to full term.

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DIAGRAMS FOR SHOWING LIMITATION OF MOVEMENTS THROUGH JOINTS, AS USED BY THE BOARD OF PENSIONS COMMISSIONERS FOR CANADA

By Captain D. E. H. Cleveland, C.A.M.C.

THAT the graphic presentation of many facts is vastly more comprehensible than their verbal description needs little argument. In a picture an idea may be presented without ambiguity, and with its essential points properly emphasized. To succeed in this regard by verbal dexterity, is an art, the mastery of which is possessed by few, and by them only after long years of practise. The advantage of pictorial over verbal expression in teaching is illustrated by the predominant part played by pictures and drawings in our studies from the kindergarten to the final college year. In medicine, we remember best the teachers who used the b ackboard with facility and enthusiasm, and we are inclined to judge the text-book by the clearness and intelligibility of its illustrations.

The work of the Medical Advisory Branch of the Board of Pensions Commissioners for Canada consists in estimating, from descriptions of pathological conditions, the extent of the disablement of the individual described. To make satisfactory estimates, it is essential that these descriptions be not only accurate and comprehensive, but also clear and concise. The medical boards by whom the descriptions are written very often find great difficulty in fulfilling these requisites. This is particularly noticeable when they describe conditions where joints have suffered partial or complete ankylosis. The method usually employed is to estimate the angle at which the ankylosed joint is fixed, or the angles of its full flexion and extension if limited in motion, but the lack of uniformity, due to the diversity of opinion regarding the angles to be measured, makes such attempts at description of very little use.

Innumerable examples might be quoted showing the difficulty of interpreting verbal descriptions by means of angles. The simplest is that of a forearm held at right angles to the upper arm by ankylosis of the elbow joint. This would generally be described as a position of ninety degrees of flexion of the forearm. But by

this some examiners would mean that the flexor surface of the forearm was at an angle of ninety degrees with the flexor surface of the upper arm, while others would mean that the extensor surface of the forearm was at an angle of ninety degrees with the position it would occupy were the forearm completely extended. It is obvious that there would be no difficulty in this case no matter which idea the examiner might have had. But if the forearm were similarly ankylosed half way between complete extension and flexion to a right angle, some examiners would describe the condition by measuring the angle between the flexor surfaces of the upper arm and the forearm and would say that the forearm was flexed to an angle of one hundred and thirty-five degrees. Others would measure the angle between normal extension and the extensor surface of the forearm and say that the forearm was flexed forty-five degrees, and still others would say that it was flexed to forty-five degrees. Each of these statements is correct. The difficulty lies in determining which angle the examiner was describing. Attempts have been made to formulate an arbitrary system by describing the angles to be measured but efforts in this direction seemed merely to add to the confusion. The instructions have been differently interpreted by different examiners and the effect of this lack of uniformity has become more and more serious as the number of cases with these conditions increased. It was early realized that some scheme of standardizing the description of these conditions was essential to the work of the medical advisers to the Pensions Board.

The first idea which occurred to me was that rubber stamps, similar to those depicting the thorax and generally used for showing graphically physical signs in the chest, might be obtained. With these it was thought that the exact degree of the limitation of movement in affected joints could be clearly shown—and the difficulties arising from verbal descriptions avoided. It was, however, found impossible to procure such stamps as were required, and the suggestion of designing stamps especially for this work was made. For this purpose some rough sketches were drawn, and, as it was discovered that there were certain disadvantages in the use of stamps, it was thought that these sketches might in an improved form be used as charts. It was then planned to make separate drawings of the skeletal structures forming each of the principal articulations and to show the point of fixation or the extent of the movement of the moving part by taking an arbitrary fixed point at the joint as the centre of a circle of which the moving part formed

the radius. On the circumference of the circle thus formed the point of fixation of the part—or the limits of its mobility could be marked. It was assumed for the sake of clearness that all movements through joints are circular and though this is not actually the case, it is sufficiently so for the purpose intended.

The point finally decided upon as the centre of the circle was that which remains constant in all the movements of the joint. In ball-and-socket joints the centre of the head of the moving bone was chosen; and in other joints the centre of the articular surface of the fixed bone.

The idea was elaborated and the draughting and printing of a complete set of diagrams was undertaken under my personal supervision. In these the fixed point is shown by a small heavy cross and the normal range of movement by an arc or a complete circle. These are subdivided into segments of one sixteenth of a circle or twenty-two and one-half degrees.

Great pains were taken to secure anatomical accuracy in the diagrams, and, though something of mathematical exactitude may have been sacrificed in showing all movements as circular, the clearness of the results has justified this assumption. The use of each diagram, of which there are thirty in all, is explained in brief on the form. These explanations have been made as concise as possible in order to avoid the loss of usefulness which not uncommonly results from long and involved instructions.

The diagrams cover all of the movements at all the joints except the temporo-maxillary. They show the outline of the body and of the skeletal structures, and include the whole of the moving part and a portion of the fixed part. In several of them the entire body is drawn. There are three showing the movements of the head on the neck, sixteen for the movements of the joints of the upper extremity, and eleven for those of the legs.

In use, these diagrams have proved not only simple but most effective. The examiner measures, with his eye, the movements or the fixed position of the limb and marks upon the circle the limits of its mobility or the point at which it is fixed. The desirability of the general use of instruments of precision for measuring angles has not yet been established to the satisfaction of the Board of Pensions Commissioners and Director General of Medical Services. Some medical boards sitting at hospitals in the larger centres are using such instruments of which simple forms are very easily improvised. With larger experience it may be found advantageous to make their use obligatory.

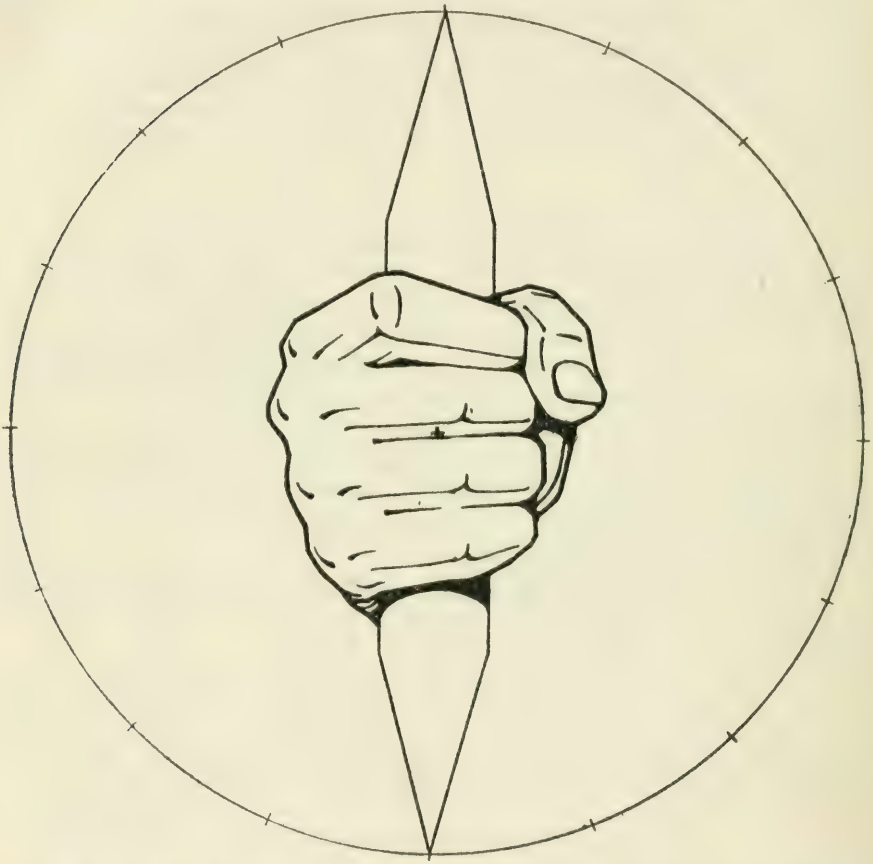
In addition to the purpose for which these diagrams were constructed, they have been found very useful in depicting the exact site and value of amputations, mutilations and serious scars, and since nearly every bone is shown in at least one of the series, a copy of radiological findings in cases where there are foreign bodies in the tissues, is by their aid easily furnished. With very little alteration they afford a graphic description of the position of and movements through false joints. These additional uses are, however, strictly subordinated to the purpose for which they are primarily intended.

A booklet is in course of preparation which will contain full instructions for the use of each diagram and will detail the additional uses to which the series may be put. This will be supplied to medical officers sitting upon boards and medical examiners for the Board of Pensions Commissioners. It is hoped that the general use of the diagrams in all cases of ankylosis and limitation of movement will result in the acquisition of a body of scientific knowledge not obtainable by any less standardized method.

Reference may be made to Fortescue Fox's "Physical Remedies for Disabled Soldiers", in which is shown a chart of somewhat similar diagrams, prepared by Dr. Cololian, of the Centre for Physical Research at Versailles.

Three of the thirty diagrams devised are published here to illustrate the principles involved.

SUPINATION AND PRONATION OF THE FOREARM



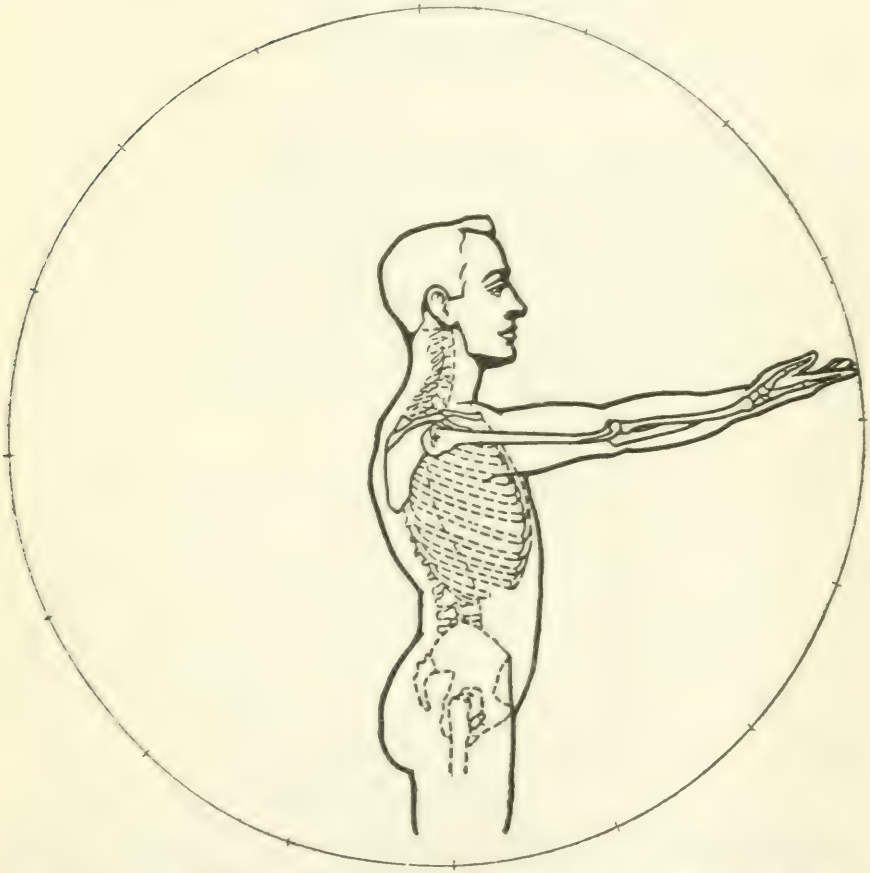
The arm should be held in position of forward elevation from the shoulder. A pencil, or similar object, to serve as an indicator, should be grasped in the closed fist so that its point will move in an arc when the forearm is rotated. Measures should be taken to prevent participation of any shoulder movement. In certain cases where shoulder movement may be a factor of importance in increasing the range of movement use one diagram to show movement in forearm solely and another in which shoulder movement is permitted, stating what each diagram is to show.

Mark with ink on the circumference of the circle in the diagram, the points indicating the position of the upper end of the pointer in extreme pronation and extreme supination (active). Join these points with an ink line following the circumference of the circle, which will then indicate the full extent of active movement.

If it is considered desirable to indicate Passive movement, also, use another diagram in the same way, stating that it shows Passive movement.

Each sub-division of the circle represents 22½ degrees or ¼ of a right angle.

CIRCUMDUCTION OF THE ARM

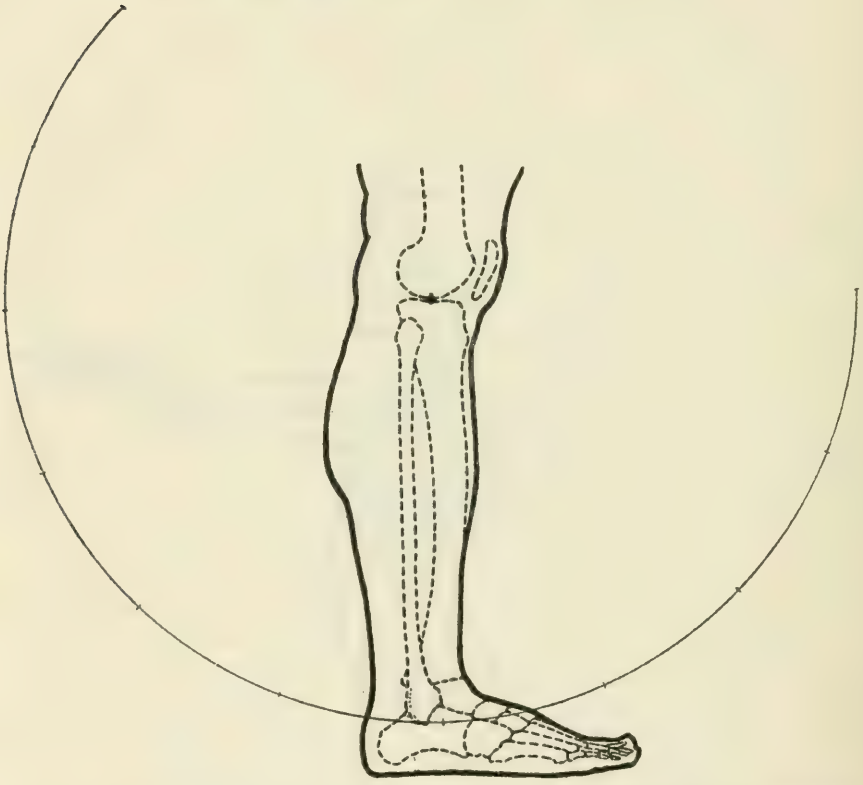


Observe the points of extreme forward and backward elevation (active) and mark these points with ink on the circumference of the circle in the diagram. Join these points with an ink line following the circumference of the circle, which will then indicate the full extent of active movement.

If it is considered desirable to indicate passive movement also, use another diagram in the same way, stating that it shows Passive movement.

Each subdivision of the circle represents $22\frac{1}{2}$ degrees, or $\frac{1}{4}$ of a right angle.

FLEXION AND EXTENSION AT THE KNEE JOINT



Mark with ink on the circumference of the arc in the diagram the point of extreme flexion (active) and of extreme extension (active). Join these points with an ink line following the circumference of the arc, which will then indicate the full extent of active movement.

If it is considered desirable to indicate Passive movement also, use another diagram in the same way, stating that it shows Passive movement.

Each sub-division of the arc represents $22\frac{1}{2}$ degrees or $\frac{1}{4}$ of a right angle.

HOW TO PROVIDE *EFFECTIVE* HEALTH ADMINISTRATION IN SMALL (RURAL) MUNICIPALITIES

By Elzear Pelletier, M.D.

Secretary-Director of the Board of Health of the Province of Quebec

ALTHOUGH provincial officials may be more numerous than municipal officials in the audience, all will frankly admit with me that, of the municipal health authority and of the provincial health authority, the most essential of the two is the municipal. Indeed, the municipal health organization could exist without provincial organization, while the provincial without the municipal end complement could accomplish almost nothing. The secretary of our section, Dr. Baudouin, once properly defined this by calling the municipal authority the "real *cell*" of the whole fabric.

Thirty years' experience in provincial health work have fully convinced me that we have not, in the rural health authorities as presently constituted, adequate machinery to carry out the work required by the Public Health Act. Seventy-five per cent. of the rural boards of health are either incapable or unwilling to act seriously, and even some small towns hardly make a better showing.

This situation is not peculiar to the province of Quebec.

After the American occupation of Cuba, the government of that island attempted, through the medium of local boards of health, to continue the thorough reform of sanitary conditions started by the Americans; but this system soon proved a failure, and, at one blow, all the local organizations were replaced by a national organization, the Government of Cuba appointing the health officials necessary to carry the work needed in each locality. All such officers stationed in the various municipalities are under the direct control of the Cuban Director-General of Public Health.

In Pennsylvania, we meet another type of organization which, while preserving the existing municipal boards of health, no longer waits after their slowness to carry out the requirements of the

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Read at the meeting of the Canadian Medical Association, Montreal, June 15th, 1918.

State laws. The Pennsylvania State Department of Health has over seven hundred agents scattered throughout the State, and these agents make up for the deficiencies of the dilatory municipal boards of health.

As to our sister provinces, I do not believe their experience differs from ours. Indeed, only last week, I unexpectedly put my hand upon an article published in the *American Journal of Public Health*, in 1900, by Dr. P. H. Bryce, who was for twenty years secretary-director of the Ontario Provincial Board of Health. Speaking of Ontario, Dr. Bryce writes: "In a province as old and as municipally advanced as most on this continent, I have for twenty years proved fully the inadequacy of the seven hundred or more local township, town, and village Boards of Health with as medical officer a local practitioner competing with his medical rivals, paid from nothing to $25.00, $50.00 or $100.00 a year for doing mostly nothing."

The cause of the failure of our rural health authorities is that they are raw, untrained material, which cannot be made to realize the importance of their work. Being small municipalities and each maintaining a separate health organization, they have been unable to secure the services of trained officials.

The reorganization of this municipal end of the health service should be undertaken and but professional sanitarians, *i.e.*, "D.P.H. men," should be put in charge, the actual inefficient local boards of health disappearing. Our universities can now supply all the professional sanitarians that would be required, and thus the only question remaining to solve is how to provide sufficiently high salaries to attract good men into this new profession.

As far as the province of Quebec is concerned, the plan I would be disposed to suggest would be the grouping of say twenty municipalities under a physician possessing the diploma in public health, who would give the whole of his time to the constant supervision of their sanitation. The present development of railways, the automobile and the telephone make now a sanitary unit of twenty municipalities one of convenient size. The medical sanitarian would have in each municipality the services of at least one assistant for routine work not requiring necessarily the attendance of the medical sanitarian.

The salary of the medical sanitarian would be fixed by the law and would, together with his travelling expenses, be paid by the municipalities on the pro rata of their population.

How would local autonomy be preserved in such an organization?

Each rural county of the province is formed into a *county municipality* whose municipal councillors are *ex-officio* the mayors of the various municipalities forming part of the county. It may be pointed out, in passing, that the average number of municipalities to a county is twenty.

Thus, should at any future time, a law, following the plan I have suggested to provide for the sanitary reorganization of the province, require the appointment of a county commissioner of health for each county, leaving the appointment in the hands of the county municipality, who would select a physician having the diploma of public health; if, moreover, the said county commissioner of health were required, by the law, to report, at stated times, to the *county municipality* as well as to the Provincial Board of Health, and lastly, if the law provided that the county municipality could dismiss its nominee for cause, after having obtained the consent of the Provincial Board of Health, these provisions would be sufficient, I believe, to guarantee local autonomy to a very reasonable extent. With the exception of the counties of Saguenay and Temiscaming, I believe the plan sketched above would fit the geographical conditions of the province, with perhaps the occasional union of two counties for sanitary purposes under a single county commissioner of health.

With "D.P.H. men" in charge of the municipal end of the health service and with "D.P.H. men" as inspectors at the other or provincial end, we ought to secure very effective and sustained work throughout the province.

I have been told that the plan just advocated would not tally with the somewhat recent departure of having district inspectors on the Provincial Board of Health staff. I do not believe there is anything in that, gentlemen. When, in 1910, the Quebec Government assented to the Provincial Board of Health appointing district inspectors, the government paying their salaries and expenses, it reached the extreme limits of what should be done at the expense of the provincial budget, and therefore what health reorganization remains to be done, must come entirely from the side of the municipal authorities. And then, as the principal subject the Provincial Board of Health had in view when appointing district inspectors was to, through them, bring municipalities to do better work, I fail to see how an argument of the existence of district provincial inspectors could be made against a proposal to improve the municipal health organism.

DISINFECTION AFTER COMMUNICABLE DISEASE

By R. K. Anderson, M.D.

Milton, Ont.

I WISH, at the outset, to disclaim any attempt to give something new or original, but will confine myself to what is considered the best means of preventing the spread of communicable disease.

My remarks will refer, more particularly, to the method adopted in the smaller towns, villages, and rural districts where there are no isolation hospitals and no disinfecting stations. I am not a firm believer in the efficacy of disinfection as ordinarily practised. It is usually done by a sanitary inspector, appointed by the council, without any regard to his suitability for such work. Sanitary inspectors should have some training to get the best results.

By disinfection is meant the employment of those means which will destroy contagion and prevent the spread of communicable disease. Any means used should be cheap, prompt, and effective in its action and should not injure furniture or other articles with which it comes in contact.

It must be applied to the bacteria in sufficiently concentrated form and must be left long enough in contact to kill them.

Its aim is to stamp out the disease and all the various means known to science should be employed. Therefore, disinfection should commence with the inception of the disease and should be practiced throughout the whole period of the illness of the patient. The greater the precaution taken at the beginning and during the illness the less the danger and trouble at the end.

Thorough and effective isolation of the patient and his attendant is of prime importance. He should be in a large room, bare of all unnecessary furniture, rugs, curtains, etc., easily shut off from the rest of the house and having an outside entrance if possible. It is desirable that the room have an eastern or southern exposure,

Delivered before the Ontario Medical Health Officer's Association May 30th, 1917.
Received for publication, July 17th, 1917.

with ample window space to admit a maximum amount of fresh air and sunlight. Free ventilation is a protection to both patient and nurse.

Arrangements should be made to supply food and other necessaries without the attendant leaving the rooms under quarantine. No article or utensil should be taken from the room without being first disinfected or boiled. The nurse should wear only such clothing as can be washed and when leaving the rooms, should wash hands and face and put on outer covering not kept in the sick room.

The floor of the room and furniture, instead of being dry swept or dusted, can be gone over with a cloth wrung out of a solution—5 per cent. of lysol, 10 per cent. of carbolic acid, or 1 to 500 of perchloride of mercury.

Remnants of food, dishes, and table utensils may be boiled. Discharges, whether from the mouth, nose, ears, bowels, or kidneys, should be burned at once or placed in a strong disinfecting solution before removal. Alvine discharges should be well mixed with the solution to ensure success. Chlorinated lime is useful for this purpose.

Blankets, sheets, or clothing should not be hung out in the porch or yard until soaked or well sprinkled with a 20 per cent. solution of formalin.

Pets of all description should be excluded from the sick room.

It is scarcely possible to fix, definitely, the time when a person suffering from a communicable disease ceases to be a danger to the public health. The time fixed by the provincial board is only approximate and should be modified to suit individual cases.

When notice is given by the attending physician that a patient is ready for release from quarantine, the M.O.H. of the municipality should visit the patient and decide for himself and for the public whether or not all danger from infection has passed. This is the duty of the M.O.H. for which the public pay him, little or much as the case may be; still it is his duty, since he accepts the office, as there is little sense in quarantining a case of communicable disease and disinfecting after, if a patient, who is the carrier of that disease is allowed to mingle with the public. It is advisable that this be made obligatory on the part of the M.O.H., then it would free him from the charge of attempting to interfere with the prerogative of the attending physician.

The patient before being released from quarantine, should be given a warm bath, using a brush and biniodide of mercury soap,

paying particular attention to the face, hands, and hair, and then rubbed with alcohol. The hands, face, and hair of the attendant should receive like treatment. Both may then be given a change of garments and the ones in use left in the sick rooms for disinfection.

In the disinfection of the room and furniture, hot water, soap, and the scrubbing brush, throughly used, along with free æration and exposure to sunlight is more efficient than either liquid or gaseous disinfection.

Boiling is the best means for treating all fabrics and utensils not injured by such process. These means alone, properly used, will free most rooms from contagion. Liquid disinfectants, however, make a valuable adjunct and may be used in the scrubbing water.

The simplest and probably the most efficient method for gaseous disinfection of rooms is by formic aldehyde and permanganate of potash.

Sixteen (16) ounces of a 40 per cent. aqueous solution of formic aldehyde and eight ounces of permanganate of potash are used for every 1000 cubic feet of air space.

The room is made as nearly air tight as possible, bedding and clothing are hung over chairs or on lines across the room, books opened and stood on end, closet doors and dresser drawers opened so as to be freely exposed to the fumes. Woollen outer clothing and bedding can be freely sprinkled with a 20 per cent. solution of formalin, and it is desirable to sprinkle the floor and walls with the same solution or with water.

Vessels containing boiling water from which steam will rise, may be placed about the room if there should be no better way of maintaining the necessary humidity of the atmosphere.

The temperature of the room should be not less than 65 degrees.

In the centre, place a tub containing about two inches of water and in this tub put a large galvanized iron pail to hold the ingredients.

Place in this pail the permanganate of potash mixed with an equal quantity of sand and pour over it the formic aldehyde solution. The operator should now make his exit expeditiously. The sand will give him a little more time, and it prevents the oxide of manganese which is formed from inhibiting some of the action of the formic aldehyde. It also prevents the violent ebullition and spilling over of the ingredients.

The room should be left closed for six hours and then freely

ventilated. The remaining gas can be neutralized by a sprinkling of ammonia water if desired.

Disinfection by formaldehyde gas is superficial at best, and, should be followed by a thorough scrubbing with hot water, soap, and brush, including in this process all woodwork and furniture not injured by such treatment. Disinfectants may be used in the water—lysol, 2 per cent., carbolic 5 per cent., or formalin, 10 per cent. Perchloride of mercury should not be used with soap. Furniture injured by scrubbing may be mopped over with one of the above solutions.

The walls may be repapered or limewashed, but this is immaterial.

While preparing this paper, I wrote to the M.O.H. of Buffalo, Chicago, Detroit, and Winnipeg, also to Parke Davis & Coy., and the *American Journal of Clinical Medicine*, asking what method they recommended and if they placed reliance on chemical disinfection.

I acknowledge my indebtedness to all of these gentlemen for their prompt and courteous replies.

They are very much in accord that isolation and hospitalization of all cases is of first importance in preventing the spread of communicable diseases; that the free use of hot water, soap, and the scrubbing brush, along with fresh air and sunlight is the best method of destroying contagion, and that liquid disinfection is more valuable than gaseous disinfection.

THE CONTROL OF INFLUENZA IN ONTARIO

By John W. S. McCullough, M.D.

Chief Officer of Ontario Provincial Board of Health

IN Ontario influenza is not required by law to be reported, placarded or quarantined, and does not come under the regulations regarding communicable disease except that, by a recent Order-in-council, land and unoccupied buildings may be taken summarily by a board of health for hospital purposes.

With respect to the closing of schools, churches, theatres and other public assemblages, each Medical Officer of Health or Local Board of Health has power to close such places if it seems desirable. The matter of placarding, and quarantining for this effection is regarded by the Provincial Board of Health of Ontario as being impracticable. The Board does not think such a law could be satisfactorily enforced for the reason that before the necessary measures (inspection, placarding, etc.) could be taken in respect to the thousands of homes, a great number of the cases would be well and the intolerable situtation of keeping comparatively well persons in large numbers tied up would ensue. Under such a regulation many people with colds would be improperly quarantined, and in short the operation of the law would, as it has been in many of the States to the south of us, be a dead letter. While the Local Board has the power to close schools, churches, theatres, etc., during epidemics of this kind, the utility of this measure of prevention is obviously limited when departmental stores, business places, street and railway cars are allowed to carry on business as usual. Where a well-equipped medical inspection of schools is in operation as in Toronto, there seems to be no doubt that the children would be better at school than running the streets and spending their time (as they have in large numbers been doing in Toronto) in the shops where the warmth and attractions are better than many of them have at home.

Before Ontario had any appreciable number of cases the Board distributed to every physician in the province a circular giving the latest information in respect to the disease. This was

succeeded by a circular to Medical Officers of Health pointing out the law and advising precautions to be taken. Finally a second circular was issued to all physicians giving information as to the character of the disease, methods of treatment, etc. The press also was largely used for the dissemination of advice to the public.

Realizing the probable necessity for nursing help throughout the province the Board organized the Ontario Emergency Volunteer Nursing Auxiliary for the training of V.A.D.'s and established a course of lectures in Toronto. Branches were formed in many of the cities and towns, some of which were supplied with lecturers, and the voluntary nurses (called Sisters of Service), were supplied in large numbers to families in need of help. In Toronto the Auxiliary was able to furnish nursing help to some one thousand families. Similar work was done in many other places such as Hamilton, St. Catharines, London, Collingwood, Barrie, etc. The Auxiliary supplied both trained and voluntary nurses to many outside points, and endeavoured, with a large measure of success, to supply medical assistance to communities where the physicians were overworked or where one or more had lost his life in the course of the epidemic.

It is estimated that there were at least 40,000 to 50,000 cases of influenza in Ontario and the number of deaths is approximately 3,500.

Strains of bacteria were procured from Boston and New York and a prophylactic vaccine prepared both by the Connaught Laboratories of the University of Toronto, and the Laboratories of the Provincial Board of Health. This vaccine has been supplied very freely to the public all over Ontario and to some extent throughout Canada. The Board in issuing this vaccine took occasion to point out that while its use rested upon a rational and scientific basis, no results could be promised with certainty. The limited reports received, however, indicate that it has been of some value in prevention of this disease.

INFORMATION *re* INFLUENZA EPIDEMIC

Cities	Population	Deaths from Influenza and Complications, chiefly Pneumonia	Death rate per 100,000 Population
Cities in Canada			
Fort William	18,850	45	238
Sault Ste. Marie	12,829	41	319
Ottawa	104,000	570	548
Port Arthur	15,224	20	131
Windsor	30,000	32	106
Kingston	22,265	145	644
London	57,301	187	326
Toronto	490,000	1,600	327
St. John, N.B.	42,511	126	296
Winnipeg, Man.	183,595	388	211
Montreal, P.Q.	640,000	3,128	489
Halifax, N.S.	46,610	153	329
Hamilton	104,491	244	233
Cities in United States			
Boston	670,585	2,084	321
Pittsburgh	533,905	3,894	721
Philadelphia	1,549,008	12,687	819
Washington	331,069	1,564	501
*Camp Sherman, Ohio.	33,000	842	2,551
New York	5,737,492	22,950	400

* In this camp, out of 2,001 cases of pneumonia following influenza, 842, or over 41 per cent., died.

and date of writing, November 7th, it will be seen that Montreal is now, barring a possible but pretty improbable recrudescence, on a fair way to its normal death rate.

From the beginning, the Department of Health took energetic means of combating the disease. When there were still only a few cases declared, advice in the form of posters and circulars were distributed to the press, the schools, and the homes broadcast.

On October 8th, an emergency meeting of the Board of Health was called at the City Hall and resolutions were adopted calling for the immediate closing of all places of public meeting, such as schools, theatres, dance halls, moving picture houses, concert halls, etc. The military authorities were called upon to confine the soldiers in the barracks. The clergy were requested to reduce to a minimum their church functions. The stores were ordered to close at 4 p.m., in order to decrease the congestion in tramcars.

On October 10th, a new Board of Health composed of physicians was named to replace the old Board which was composed of laymen. The Board immediately confirmed the above mentioned decisions and further decreed that all churches should be closed on Sundays, that stores, with the exceptions of those selling necessities of life, should close at 4 p.m., that all places of amusement, whether in halls or out of doors, should be closed. Several rules were adopted concerning boarding schools, public offices, hospitals, banks, Courts of Justice, tramcars, the transportation of bodies of persons dead from influenza, etc.

At the very beginning of the epidemic, steps had been taken to provide an emergency hospital for influenza patients too poor or friendless to be treated at home or unable to get a place in the general hospitals.

The Meurling Refuge was fitted up as a hospital with 225 beds. This was soon found to be insufficient and the following emergency hospitals were opened:

Moreau Street Civic Hospital, 60 beds; St. Joseph's School, 49 beds; St. Justine (for children), 50 beds; St. Arsène Orphanage (for boys), 50 beds; St. Clement's School, 75 beds; the Grenadier Guards Armoury (loaned by the military authorities), 75 beds; one hospital for the Chinese, 12 beds.

The general hospitals pooled their resources with the civic hospitals, and patients were sent to the Royal Victoria Hospital,

Montreal General Hospital, Hôtel Dieu, Notre Dame Hospital, Alexandra Hospital, St. Paul Hospital, and the Western Hospital.

The staffs of the emergency hospitals were formed of the physicians and nurses in the employ of the city, with the help of the Roman Catholic communities of Nuns and Brothers, both from teaching and from charitable institutions, the former as nurses and the latter as orderlies. These communities were:

The Grey Nuns, the Nuns of the Holy Cross, of St. Ann, of the Holy Names of Jesus and Mary, of the Congregation of Notre Dame, of the Providence, of Hope, of the Immaculate Conception, les Filles de la Sagesse; Brothers of the following orders: Christian Schools, St. Gabriel, Christian Instruction.

The co-operation was enlisted of the following organizations: St. Vincent de Paul Society (with their eighty sections), Société Catholique de Protection et de Renseignement, Victorian Order of Nurses, Canadian Red Cross (English and French sections), Imperial Daughters of the Empire, Montreal Day Nursery, Emergency Nursery, Patriotic Fund, Jewish Federation of Charities, Melville Social Service, Red Mogen Dovid, Canadian Belgian Musical and Dramatic Club, Charity Organization Society, Iverley Settlement, University Settlement, Soldiers' Wives' League, Catholic Social Service Guild, Irish Protestant Benevolent Society, etc.

Besides giving help in the emergency hospitals, the Roman Catholic communities of Brothers and Nuns also gave splendid service in visiting families and giving aid of all kinds to the poor and the destitute.

In order to co-ordinate all these efforts, as well as those of physicians and nurses willing to help their confrères who had too many patients on their hands, a bureau was established at the City Hall Annex in charge of a competent civic employee whose work soon had the desired effect in directing help to the poor who could not get medical attendance.

A similar bureau on a much wider scale was established uptown where a number of ladies divided in a French and an English section, also did excellent work in procuring medical attendance, food, fuel, clothing, etc., for the poor.

The necessary co-operation between the hospitals, both civic and general, was established through a Hospitals Commission who worked untiringly during the peak of the epidemic, directing the sick to the hospitals nearest their residence.

The police and firemen forces generously aided in this difficult question of helping the poor by undertaking to carry food

and fuel to the homes of those who could not go out to get these necessities or who could not afford to pay for them.

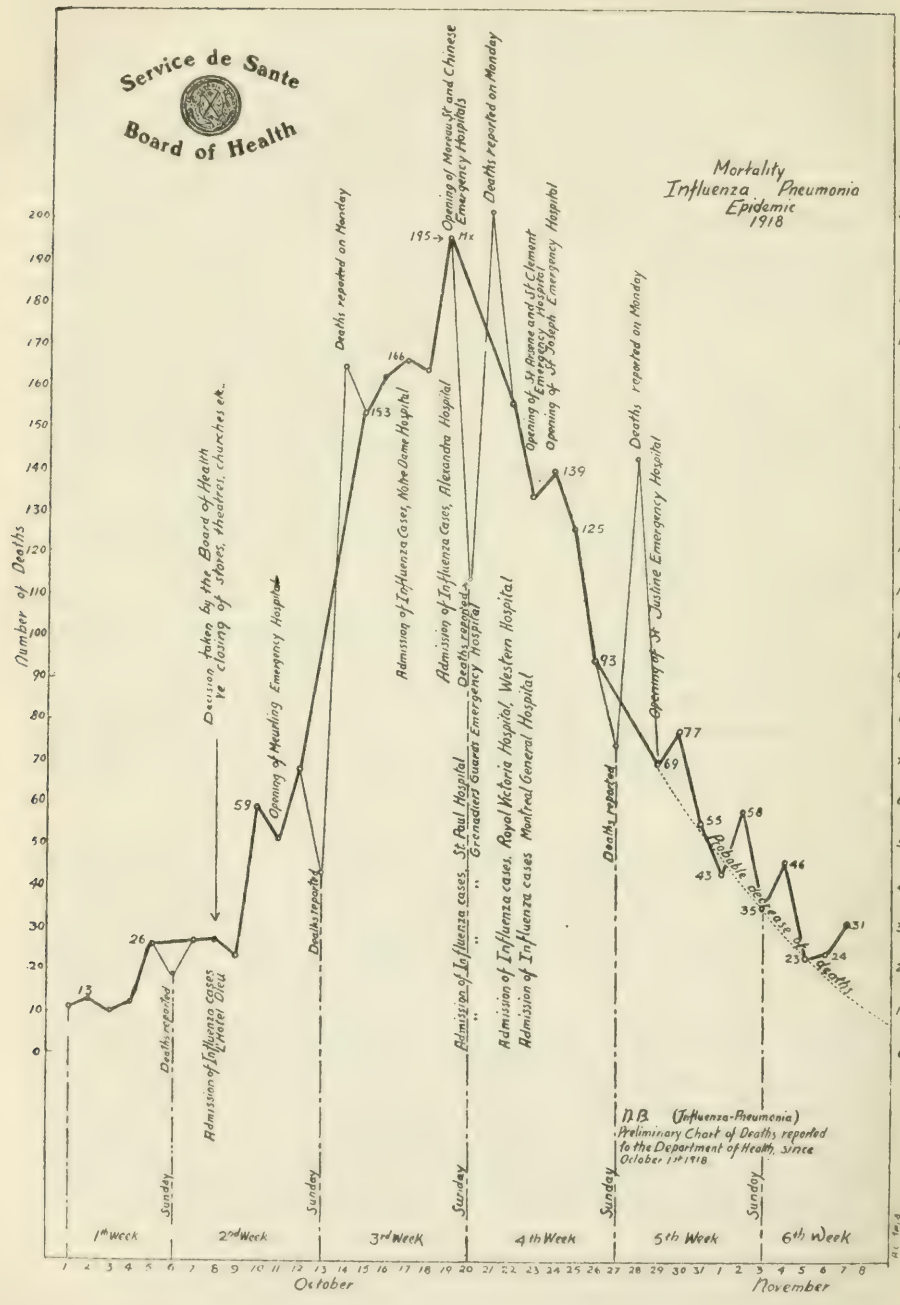
Although all this organization was extemporised, it worked out harmoniously and smoothly. It was inevitable that at first there would be some delays, but the staffs of the several emergency hospitals soon settled down to the routine and eventually all was in splendid order. During the first days there was some congestion in the admittance to the hospitals and some criticism was brought against the management of the Meurling Hospital because it did not very promptly fill its beds.

This criticism was most unjust, inasmuch as it remedied nothing, but it soon died out and the Hospitals Commission, which was appointed upon its representation, admitted that the management had done splendidly. The opening of the other emergency hospitals and the pooling of the resources of the general hospitals through a committee of ambulance service composed of Dr. Dunstan Gray, Dr. F. X. Lessard, of Notre Dame Hospital, and Mr. Webster, of the Royal Victoria Hospital, had the desired effect of abating the congestion.

Thanks to the officer commanding the A.M.S.C. of the 4th District, a number of military medical men were available for the emergency hospitals and rendered most valuable help.

The accompanying charts show the course of the disease from October 1st and the organization of the fight against it. They will be of much interest to the reader because they show at a glance what was done and what was the results of the combined efforts.

The Board of Health whose untiring work in seconding the efforts of the writer was of inestimable value, is composed of Mr. E. R. Decary, president of the Administrative Commission, chairman; Dr. David J. Evans, vice-chairman; Dr. Horst Oertel, Dr. L. de L. Harwood, Dr. J. E. Dubé, Mr. Beaudry Leman, His Worship the Mayor being also a member ex-officio. Their energy in dealing with a most serious and difficult situation, their devotion to the grave responsibilities they had to shoulder have been most. marked The writer is especially glad to tender to Mr. Decary his grateful acknowledgement of the most valuable support he got from him in his dual capacity as president of the Administrative Commission and of chairman of the Board of Health.


Service de Sante
Board of Health
Mortality
Influenza Pneumonia
Epidemic
1918
Number of Deaths
Deaths reported
Admission of Influenza cases Hotel Dieu
Decision taken by the Board of Health re closing of Stores, theatres, churches etc.
Opening of Mewburn Emergency Hospital
Deaths reported on Monday
Admission of Influenza Cases, Notre Dame Hospital
Admission of Influenza Cases, Alexandra Hospital
Opening of Morrow Jr and Chinese Emergency Hospitals
Deaths reported on Monday
Admission of Influenza cases St Paul Hospital
" " Grenadier Guard Emergency Hospital
Deaths reported
Admission of Influenza cases Royal Victoria Hospital, Western Hospital
Admission of Influenza cases Montreal General Hospital
Opening of St Anne and St Clement Emergency Hospitals
Opening of St Joseph Emergency Hospital
Deaths reported on Monday
Opening of St Justine Emergency Hospital
Deaths reported
Probable decrease of deaths
N.B. (Influenza-Pneumonia)
Preliminary Chart of Deaths reported to the Department of Health, since October 1st 1918
1st Week
2nd Week
3rd Week
4th Week
5th Week
6th Week
Sunday
October
November

POLYA'S METHOD OF ANASTOMOSING THE PROXIMAL GASTRIC STUMP WITH THE JEJUNUM

By E. M. von Eberts, M.D.

Surgeon to the Montreal General Hospital

THE hope that cancer of the stomach might be permanently cured by means of gastrectomy has in recent years been realized in many instances. More numerous are the cases in which life has been materially prolonged, and the procedure of gastrectomy has now been placed upon such a basis of technical skill that the rooted disbelief in its value, either palliative or curative, is being replaced by a feeling of hopefulness on the part of the general practitioner, with the result that the number of cases submitting to operation is steadily growing.

Later results are what we find them to be for three reasons: (1) the earlier diagnosis of cancer; (2) the increased frequency with which pylorectomy is performed upon cases which are diagnosed clinically as ulcer, in which subsequently the presence of secondary carcinomatous changes is demonstrated; and (3) the progressive improvement in surgical technique, which has enabled surgeons to include in the class of operable cases many of those which previously would have been rejected as inoperable, and to remove with constantly diminishing danger to life increasing areas of the stomach wall.

Before Polya demonstrated the practicability of anastomosing the proximal gastric stump, throughout its whole length, directly with the jejunum, there was a definite limit to the extent of stomach resection, because sufficient stomach wall had to be left for the establishment of a gastro-jejunostomy (Billroth method No. 2). This restriction was in part responsible for the frequency of recurrence. Among the technical defects of the method should be mentioned insufficiency in the gastro-jejunal anastomosis, the danger of tension and kinking in the anastomotic loop, and of necrosis in

Read before the Montreal Medico-Chirurgical Society, March 1st, 1918.

the suture line, arising from the defective blood supply on the stomach side. These various causes of failure were met by Polya, and a thorough trial of his method confirms his original contentions: (1) that this procedure of gastro-jejunostomy is easily performed; (2) that union between the stomach and the intestine is effected without tension; (3) that necrosis or leakage is unlikely to occur; (4) that the mechanical conditions for the emptying of the stomach are as favourable as possible, because the opening is broad and lies at the aboral end of the gastric stump; and (5) that the operation can be done much more quickly than the former procedure, which, owing to its lengthiness, had often to be done in two stages.

According to Polya's method, the jejunal loop is brought up through a slit in the mesocolon. By this means freedom of action is secured. At the conclusion of the anastomotic suture, the stump of the stomach is drawn down through the opening in the mesocolon, and the edges of the mesocolon are secured to it. If a high resection is performed, this latter stage may present serious difficulties. In such cases the small bowel should be brought up in front of the transverse colon, and the anastomosis with the jejunum performed at a distance of from fifteen to eighteen inches from its origin. By this method, as shown by Balfour, the death rate has been very greatly reduced.

When Polya published his article in 1911, he had tried his method in six cases. Three of the patients died within from twenty-four to forty-eight hours after operat on; and a fourth, from erysipelas and duodenal fistula, on the forty-ninth day after operation. The other two left the hospital cured.

In the three cases here reported Polya's original procedure was followed in each instance. In none did vomiting occur after operation, and all three patients left the hospital free from symptoms.

Case 1. T. T., aged forty-two, a Russian labourer, was admitted to the Montreal General Hospital on May 18th, 1917, complaining of pain in the stomach and vomiting.

The personal and family histories were negative.

Although admitting that he had suffered from attacks of indigestion for ten or twelve years, the patient stated that his present illness began eight months ago, with pain in the epigastrium, which came on from two to four hours after meals and radiated to the right shoulder and back. More recently there had been vomiting. The pain was relieved by vomiting and by taking food. The patient had never noticed blood in the vomitus or stools. The appetite was poor. There had been a loss of thirty pounds in

weight during the preceding eight months. The patient was pale and poorly nourished. He had almost constantly a feeling of distress or pain in the epigastrium. On examination a distinct mass was felt in the region of the pylorus.

Test Meal. 300 c.c. given. In seventy minutes 270 c.c. withdrawn. Reaction, acid; free HCl absent; total acidity, 26; no occult blood.

A bismuth series taken by Dr. Wilkins showed the following:

"Meal enters stomach without feature. Outline of stomach regular except at pyloric area, where defect is visible. Duodenum does not form. Tenderness present over pylorus Large, actively contracting stomach. At six hours half of meal is still present.

Summary. There is a lesion at the pylorus. The general action and appearance of the stomach would suggest ulcer rather than carcinoma."

While the history and radiographic findings pointed to the probability of a chronic peptic ulcer, the presence of a mass, the true anorexia, and the absence of free hydrochloric in the gastric secretion, suggested the possibility of carcinoma.

Operation. On May 23rd, 1917, under ether anæsthesia, an incision was made through the right rectus, exposing a large, indurated, inflammatory mass, occupying the greater part of the lesser curvature of the stomach. There were numerous enlarged, soft glands in the gastro-hepatic omentum and beneath the pyloric ring. The fundal portion of the stomach was very greatly dilated.

After preliminary ligation of the vessels, the pylorus was divided immediately distal to the ring, and the cut edges were cauterized. The duodenum was closed with continuous through-and-through suture of chromicized gut, followed by musculo-serous suture with linen. The stump was then buried in the capsule of the pancreas. As much of the fundal portion of the stomach as possible was then withdrawn from the wound; the jejunum was passed upward through a rent in the transverse mesocolon, and the posterior sero-muscular suture of the stomach to the jejunum was inserted. The stomach was then divided with cautery, distal to the clamp. The jejunum was opened, and the suture of the anastomosis completed in the usual way, using a chromicized gut for the through-and-through mucous stitch. After the removal of the clamps, the stump of the stomach was drawn through the rent in the mesocolon, and the mesocolon stitched to the stomach 1 cm. above the suture line. Although a very large resection of the stomach was carried out, there still remained, owing to its hypertrophy and dilatation, a large

fundal pouch, and no difficulty whatever was experienced in suturing the mesocolon above the line of anastomosis.

Following the operation, hypodermics of strychnine (grs. 1-40) and camphor (gr. 1) were administered every four hours. Six ounce rectal salines, containing 5 per cent. dextrose, were given at similar intervals. There was no vomiting. Lenhartz diet was begun on the fifth day, and convalescence was uninterrupted.

On June 21st, 1917, Dr. Wilkins took a second bismuth series, with the following result:

"Meal passes down œsophagus without feature. Stomach is pyramidal in shape apparently about half of distal portion having been excised. Meal leaves stomach quickly. At one and one-half hours less than one-eighth of meal is present. At three hours the quantity is practically unchanged and the meal is entering the large bowel. At six hours the stomach is empty and practically the entire meal is in the large bowel."

Pathological report. "Adeno-carcinoma. The gross appearance is suggestive of old healed peptic ulcer with malignancy superimposed."

The patient was discharged on June 28th, 1917.

On December 3rd, 1917, he was re-admitted. His general condition showed a marked improvement, and there had evidently been a gain in weight. The abdomen was soft, without palpable mass or visible peristalsis. The patient was free from pain, had a good appetite, and could take anything in the way of ordinary diet. In September, 1917, he had had an attack of burning pain in the epigastrium, which bore no relation to the taking of food and was not present at night. There had been no vomiting.

Test meal. 300 c.c. given. In one hour a residue of 120 c.c. withdrawn. Free HCl., 48; combined acid, 24; total acidity, 72.

An *x*-ray series was taken by Dr. Wilkins on December 4th, 1917.

"Meal enters stomach in normal manner and commences to leave early by gastro-enterostomy opening. At three hours the stomach is empty, head of column being at splenic flexure. At six hours the entire meal is in large bowel."

Case 2. W. C., aged thirty-five, a sailor, was admitted to the Montreal General Hospital on September 4th, 1917, complaining of epigastric pain, nausea, and vomiting.

The family history was negative.

Personal history. For the past eighteen years the patient had

been doing manual labour. For eight or ten years he had used alcohol and tobacco to excess. At twenty-five he had a syphilitic infection, which was treated at that time for two months with mercury. More recently he had been treated with salvarsan. At twenty-seven he had gonorrhœa.

Present illness. In April, 1913, he first noticed pain in the epigastrium, occurring directly after eating and lasting for about one hour. The appetite remained good, and there was no loss of weight. Between October, 1913, and April, 1914, the patient was free from all symptoms. On the latter date the symptoms which had been present in the first attack returned with increased severity. Practically the same periods of discomfort, alternating with freedom from all symptoms, recurred until 1917. In April, 1917, pain in the epigastrium returned with much more severity. There was a severe burning sensation after eating, and tenderness over the epigastrium. The patient was relieved by taking soda, but not by taking more food. In June, 1917, vomiting occurred for the first time and subsequently about once a day. As it invariably relieved the pain, the patient learned to induce it. Blood was never noticed in the vomitus or in the stools. Although his appetite was good, the patient refrained from eating, because he feared the pain which followed. With this restriction in diet there was between June and September, 1917, a loss of about thirty-five pounds in weight.

Examination on admission to the surgical service. October 7th, 1917. The patient was very thin and had apparently lost a great deal of weight. All the teeth were either crowned or filled. The thoracic organs were normal. There was no glandular enlargement. The abdomen was scaphoid, with well marked tenderness in the epigastrium and in the regions of the pylorus. There was no palpable tumour. The bowels were constipated.

Ewald's test meal. 300 c.c. given. In one hour 200 c.c. withdrawn. Total acidity, 25; free HCl absent; no occult blood.

There was a triple Wassermann reaction.

An *x*-ray series by Dr. Wilkins showed the following:

"Meal enters stomach without feature. Stomach rather small, atonic. Tenderness present in epigastrium. Lower border at umbilicus. At one and one-half hour about one quarter of meal remains. At three hours the quantity is unchanged. At six hours the quantity is slightly less and about one half of meal has entered the large bowel.

Summary. The presence of tenderness, associated with six-hour retention, would suggest pyloric ulcer."

Operation. On October 10th, 1917, an incision was made through the right rectus, exposing a small stomach, with an area of marked induration astride the lesser curvature at the junction of the vertical and horizontal portions of the stomach. There were enlarged soft glands in the gastro-hepatic omentum. It was at first decided to excise the ulcer. After the removal of the indurated area, however, it was found that, at the margin of the ulcer, there were numerous friable papillomatous masses, very suggestive of malignancy; that there was extensive superficial ulceration of the whole of the pyloric portion of the stomach; and that at the pyloric ring a second chronic ulcer was surrounded by similar papillomatous growths. It was therefore decided to do a gastrectomy. The ordinary procedure was followed in closing the stump of the duodenum. The stomach was then drawn down as far as possible, and the whole of the fundal portion removed with the exception of a small pouch. Anastomosis was then effected between the stump of the stomach and the lateral wall of the jejunum, which was brought up through a rent in the transverse mesocolon. In this case, contrary to the experience in Case 1, there was some difficulty in suturing the margins of the divided mesocolon to the stump of the stomach, and one might better have followed the more recent practice of bringing the jejunum up to the stomach stump in front of the transverse mesocolon.

Pathological report. "Gastr tis polyposa (precancerous)."

Convalescence was uneventful. The wasting was very profound for the first ten days after operation, but there was no vomiting. The usual post-operative measures were followed. Lenhartz diet was begun on the fourth day.

On November 1st, 1917, a further *x*-ray examination was made by Dr. Wilkins, who reported as follows:

"Meal passes down œsophagus without feature, and leaves very rapidly by the gastro-enterostomy opening. Capacity of the stomach extremely small. The stomach is apparently empty within fifteen minutes. At one and one-half hours the head of column is at sigmoid. At six hours there is no change of importance

Summary. The feature of note in this case is the extreme rapidity with which the stomach empties."

The patient was discharged on November 5th, 1917.

Case 3. X. C., a farm labourer, was admitted to the surgical service of the Montreal General Hospital on October 30th, 1917, complaining of epigastric pain and vomiting.

The family and personal histories were negative.

In 1910 the patient began to be troubled with pain, which came on about two hours after meals, starting in the epigastrium and radiating to the back. For the past four years there had been almost daily vomiting. Between 1910 and 1917 the patient had lost about fifteen pounds in weight.

On admission he was found to be well nourished. The teeth were in good condition. The bowels were regular. General examination was negative. On deep palpation there was tenderness beneath the left costal arch.

After admission the patient complained daily of pain in the epigastrium, coming on about two hours after the taking of food. Vomiting usually occurred late each afternoon.

A bismuth series by Dr. Wilkins on October 26th, 1917, showed the following condit ons:

"Meal enters stomach without feature. Normal, tonic, vertical stomach, regular in outline. Lower border below umbilicus. No tenderness present on pressure. Pain, when present, is said to be in epigastrium. At one and one-half hours about one half of meal is present. At six hours the quantity is unchanged. The duodenum forms well, but at the pyloric orifice is a slight protrusion which is indicative of ulcer.

Summary. The marked six-hour retention and the presence of irregularity in pyloric orifice is indicative of ulcer."

Test meal. 300 c.c. given. In one hour 275 c.c. withdrawn. Free HCl, 46; total acidity, 69; no occult blood; no sarcinæ or Boas Oppler bacilli.

Operation. On November 2nd, 1917, an incision was made through the right upper rectus. The stomach was withdrawn from the abdomen with difficulty. A large saddle-shaped ulcer occupying the lesser curvature and several small ulcers involving the greater part of the pyloric portion of the stomach were found. Owing to the extent of the disease it was decided to do a complete pylorectomy There were no enlarged lymphatic glands. After closure of the duodenal stump and complete removal of the pyloric portion of the stomach, anastomosis between the gastric stump and the jejunum was effected by Polya's method.

Lenhartz diet was begun on the fourth day of convalescence.

There was no vomiting after operation. The patient was discharged on November 24th, 1917, free from symptoms.

Pathological report. Chronic peptic ulcer.

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The *British Medical Journal* finds that the war has caused a marked decline in the proportion of suicides to the population. Among males the rate per million was 157 in the ten years ending 1910, 151 in 1914 and 105 in 1915. In 1916 it was a little higher, 111. The rate of suicides among women showed a fall from forty-seven in the years 1901-10 to forty-five in 1914 and 1915 and thirty-eight in 1916. The greatest reduction among men was at the ages of forty-five to sixty-five whereas for women of later middle age the rate had not fallen at once. The reason for this according to the Journal, is the increased employment opened up by the war. Fresh interests and diversions have given the mind a new outlook on life.

A SHORT NOTE ON IRREGULARITIES OF THE HEART, IN ASSOCIATION WITH VISCEROPTOSIS

By William S. Morrow, M.D.

Montreal

IT it a matter of common knowledge that visceroptosis is usually associated with a tendency to neurasthenia and that among the symptoms of neurasthenia functional disorders of the heart hold a prominent place. In one sense these statements cover all I have to say to you to-night.

It has been my experience, however, to be consulted about many cases of arrhythmia by the sufferers themselves or by their medical attendants, in whom other symptoms of neurasthenia were slight and in whom a downward displacement of the heart had been overlooked.

For this reason I thought it well to draw the attention of the Society to what I believe to be a matter of some importance. The symptoms complained of in these cases have been frequent or violent beating of the heart on slight exertion, continuing for a few minutes, or hours, or days. The pulse has sometimes been simply frequent, sometimes marked by extra systoles and sometimes has shown the absolute irregularity characteristic of auricular fibrillation. In none of the cases under consideration have there been definite signs of organic disease, but it has not been considered necessary to exclude any on account of a slight dilatation alone, as some degree of dilatation is a very common result of functional disorder.

A reasonable attempt has been made to exclude other causes of disturbed heart action, such as physical or emotional strain, hyperthyroidism, indigestion, alcohol, tobacco, and other excesses.

In a considerable number of cases the above and similar causes do not seem to supply a satisfactory explanation and the outstanding features seem to be a frequent or irregular heart action following some slight exertion with displacement of the heart downwards

Read before the Montreal Medico-Chirurgical Society, March 1st, 1918.

one or more spaces. Where search has been made, there has usually been observed some lack of tone in the abdominal muscles and sometimes other indications of lowered vitality.

Like many men in practice, my case notes are lacking in detail for purposes of paper writing, as they only record the more important positive findings. They are also numerically few, as for every ten cases seen, I have only notes for two or three. With this word of apology I will refer to a few cases very briefly.

Case 1. Seen a couple of months ago, is described in my notes in the proverbial ten words of the laconic telegram, but gives the main points in a nutshell: heart low, diffuse apex beat, history of pain and palpitation.

Case 2. Seen May 13th, 1917. Young man, aged twenty-one. Heart beats fast on slight exertion. Rate went up to 170 on one occasion after walking up a moderate hill. History of so-called rheumatic pains without fever. Pulse, lying down, 82, regular. Heart: relative dulness upper margin of fifth rib; absolute dulness upper margin of sixth; transverse, 5 cm. to right and 8 cm. to left. Sounds normal, except for slight accentuation of pulmonary second. His tonsils were unhealthy looking and he had them removed the following month. After this he spent the summer in the country, largely in the open air and took lots of exercise. He wore a wide belt and took a tonic. In December he had improved in every way. He looked and felt well and his muscular development had improved remarkably. His pectoral muscles were so thick that it was not very easy to determine the upper level of the cardiac dulness, but it seemed approximately normal, and his heart was not troubling him as before.

Case 3. Man of forty-six, seen November 21st, 1916. Complained of palpitation of heart on exertion, and indigestion. Pulse 60, occasional extra systoles. Heart displaced downwards two ribs.

Case 4. Woman about thirty-five, seen December 8th, 1914. Heart thumps whenever she exerts herself. Sometimes has pain down left arm to elbow. Symptoms chiefly after sudden effort or on going up hill. Uneasy feelings about heart when she lies down. Suffers with flatulence and painful menstruation. Heart low and displaced a little to the left. Otherwise normal.

Case 5. Seen only twelve days ago. A man, aged thirty-nine, taken with violent rapid heart action while playing indoor golf. I did not see him till the next morning when his pulse was absolutely irregular and about 100 per minute. On examining him lying down, I did not detect any displacement of the heart, but when he came

to my office a few days later, I examined him in the erect position, and his heart was at least a rib low. In the meantime his heart action had returned to normal.

I have some hesitation in including this case, as he had suffered from hyperthyroidism some years ago until relieved by an operation performed by Dr. von Eberts. It is, however, but rarely that we can trace a pathological condition to a single cause. We more frequently have one if not more predisposing causes at work in addition to the more obvious exciting cause.

In looking back over the few cases I have referred to you may have observed that one suffered from indigestion, one from painful menstruation, and one from unhealthy tonsils. These circumstances may have contributed in some degree to the causation of the disturbed heart action; but the fact that displacement of the heart is so common in cases of disturbed function is strongly suggestive of its having some causal relation thereto.

I have not dwelt on the abdominal indications of visceroptosis, but there have usually been some signs present where they have been looked for. For instance, in a case very similar to the last described, and fresh in my memory because it was only seen last week, not only was the heart a rib or more lower than normal but it was very easy to press the hands deep into the abdomen and feel the right kidney descend with every breath. I may add that the patient was a middle aged man.

Every case of functional disturbance of the heart is not due to ptosis, but it is I believe a factor of sufficient importance to be worth looking for. On the other hand, cardioptosis may be due to various causes and is not always followed by functional disturbance of the heart. Stacey Wilson gives among the causes of downward displacement: "the accumulation of fluid in the pleural cavities, the presence of an abnormal amount of blood in the thorax, and severe cases of mitral stenosis and emphysema," but with a little care, these cases are not likely to be confused with ones like those I have described.

In confirmation of the fact that the heart is often displaced downwards, let me quote Sir Clifford Albutt, writing on functional disorders of the heart in his "System of Medicine". He says: "The heart itself may drop considerably." August Hoffman, de la Camp, and Rummo, were among the first to describe cases of cardioptosis. Wenkebach has shown by skiagrams, and otherwise, that in extreme lapse of tone with flaccid abdominal walls the heart may dangle

from its own vessels (cor pendulum) and may even tug at the trachea on each systole."

It is easy to understand how in such cases the circulation through the veins may be interfered with and also how the cardiac nerves may be subjected to tension.

In my experience, many cases such as I have described do well. In making a prognosis one has to consider the degree of visceroptosis, and also the amount of neurasthenia present. In the slighter cases it is my custom to prescribe a wide canvas belt such as athletes wear, in addition to ordinary braces, not instead of them. I also give a sedative mixture, such as belladonna and bromides in combination. In more pronounced cases it may be necessary to have a special abdominal belt made. When the heart symptoms have subsided it is often wise to prescribe exercises in the open air and tonics.

In many cases the symptoms disappear in a few hours and may not return at all or only after a long interval. In other cases the symptoms return after any physical or nervous strain and we may have all degrees of severity up to troublesome attacks of paroxysmal tachycardia.

An interesting fact about the radium content of sea salt has been established. Samples of sea salt, collected during a recent voyage in the Pacific and sub-Arctic regions, have been examined for their radium content. The amount of radium was found to be negligibly small compared with the values that have been found by others collected near land, and this result is in accordance with the prevailing view that the radium content of sea salt di minishes with increase of distance from land.

Case Reports

BRIEF CASE REPORTS FROM THE EAR, NOSE AND THROAT CLINICS OF THE WESTERN HOSPITAL, MONTREAL

By George T. Ross, M.D., D.C.L.

I. Frontal Sinusitis with Orbital Complication

MRS. C. D., aged fifty-two, was admitted to the Western Hospital on March 6th, 1915, complaining of severe pain over the left frontal sinus and œdema of all the left orbital cellular tissues and eyelids, making it impossible to open the lids by voluntary effort. There was not much chemosis of the conjunctiva. Temperature 101°, pulse 100. A history was given of so-called neuralgic attacks in this region for the previous six months, which were relieved from time to time by ordinary measures. The nose showed marked deviation of the nasal septum with convexity to the left which interfered with drainage.

At operation I made the usual circular incision in the orbit, beginning at a point corresponding to the pulley of the superior oblique muscle, to avoid the annoying diplopia which so often follows the radical Killian operation. The floor of the frontal sinus was found eroded and discharging pus into the orbital tissues below. By enlarging the floor opening, easy access was obtained to the entire left sinus, making it unnecessary to remove any bone above the supra-orbital ridge. The naso-frontal duct was found blocked by the swollen tissues, but the lachrymal duct and sac were unaffected. The usual toilet of this operation was completed, leaving a small drain at the inner orbital angle, as well as a drain into the nares, after enlarging the obstructed duct. I reserved opening the ethmoid cells until the later necessary operation to straighten the deflected septum, when the work could be done intranasally under local anæsthesia. Conditions being favourable, about ten days later I did the sub-mucous operation, opened the anterior ethmoid cells intranasally and removed the left naso-antral wall to drain the antrum on that side which was likewise

infected. The result was satisfactory with no external deformity. Some months later a small sinus appeared at the inner angle of the orbit and persisted for some time, but finally closed. The case was practically one of pan-sinusitis with the exception that the posterior ethmoids and sphenoid were not implicated. These cases are frequently diagnosed as neuralgic before external evidence of sepsis occurs.

Authors (as Hirscheld) say that nearly all inflammations of the orbit are caused by empyema of adjacent accessory sinuses, and that even in the case of maladies affecting the texture of the eyeball and appendages they may at times be traced to the same source either directly or indirectly. Chronic conjunctivitis, corneal ulcer, dacryocystitis, etc., may originate in this way. I had a case lately of orbital cyst on the roof of the orbit. When the ethmoid condition was cured, the cyst disappeared. Again, you may get ocular symptoms from a septal spur or deflected septum on which the swollen turbinates impinge; or from occlusion of the natural sinus orifice due to the same cause. One author reports four hundred and nine cases of eye disease in which blindness was caused in sixty-six, or 16 per cent. through empyema of the frontal, ethmoidal or antral sinuses. Again it has been proved by actual demonstration that in cases of orbital cellulitis, where the nasal examination is negative, the original sinusitis which caused the diseased eye condition, may have healed by discharging into the nose, while the orbital infection remained and progressed, owing to the absence of drainage from the socket. The evidence goes to show the necessity for close co-operation between workers in these special regions.

II. Retro-Orbital Carcinoma

Mr. A. B., aged sixty-two, previous health good. Mother died of cancer. For a number of weeks the sole objective symptom was exophthalmos of the left eye from posterior pressure. The growth seemed located in the cellular tissues of the socket. As proptosis increased, the pupil became divergent and although the adjacent glands were not enlarged, malignancy was suspected in view of the family history.

On November 22nd, 1913, I did the Caldwell-Luc operation on the maxillary antrum, as well as the external operation on the ethmoid labyrinth of the same side. The cavities in both antrum and ethmoid were found infiltrated with carcinoma. A portion of the floor of the orbit, being found necrotic, was taken away, as well as

an area on the posterior antral wall, also the naso-antral wall of that side. After operation, the parts healed up and the patient gained in strength for a time. He took a trip to New York where he consulted Dr. R. C. Myles and others of the Polyclinic Hospital. Radium therapy was discussed but was neither advocated nor employed. The Hiss leucocyte extract was used with some apparent benefit for several weeks. Recurrence, however, asserted itself and the patient only survived eight months. The growth was very free from pain. There was not at any time the least brain functional disturbance to indicate spreading of the tumor backwards through the sphenoidal fissure.

III. Primary Carcinoma of Left Maxillary Antrum

J. S., aged fifty-six, referred by Dr. George Hall, consulted me on June 6th, of this year. Personal and family history good. The present trouble he dated from a cold contracted in October, 1916, since when a free nasal discharge has continued from the left side, which had not been benefitted by ordinary treatment of his family physician. With exception of this discharge, with slight pain and tenderness on pressure over the left maxillary antrum, he claimed to be in excellent health, and constantly working at his trade (a butcher).

Examination disclosed the following conditions, viz.: Mucopurulent discharge from left nostril, tumefaction of turbinals, no bulging of naso-antral wall, no external swelling, some tenderness on pressure over canine fossa. In the mouth, the soft tissues of the hard palate were loosened from the bone on left side, forming a tumour 4 cm. by 2 cm. on roof of the mouth. On palpation this tumour gave a boggy sensation to touch but no fluctuation. It corresponded to the left antral floor. On opening the tumour, some very fœtid pus escaped and the probe passed freely into the antral cavity without the least obstruction. Extensive necrosis of the hard palate bone was found in the region referred to. Owing to the destruction of bony tissue and general infiltration of contiguous parts, as well as some enlargement of adjacent glands, it was evident that we had more to deal with than a simple empyema of the sinus. On June 16th last I did the radical Caldwell-Luc operation, and removed the necrotic hard palate, the anterior wall of antrum and the naso-antral wall, giving free access to the entire sinus. The contents were carefully removed by curettement until healthy bone was reached. The pathologist reported the specimen to be

carcinoma. The subsequent course of the case was at first promising as the parts healed up and although some discharge continued, the patient maintained his strength and gained weight, working all summer and claimed to feel well. The glands remained quiescent. Recently there was distinct evidence of recurrence and the outlook is therefore unpromising. The question of radium was not considered in this case. Recent reports of some good results from the employment of this substance in sarcomata, have not met with the same encouragement when applied to carcinomatous cases. In any event, until the city or municipality undertakes as a beneficient measure to provide this line of treatment to the community, its price for therapeutical employment is prohibitive to the ordinary citizen.

IV. Pistol Shot of the External Auditory Meatus; Recovery

A. B., aged twenty-seven, male, a well-developed young French-Canadian, was admitted to the Western Hospital on September 9th, 1915, with a history of having been shot in the ear and lost much blood in consequence. His condition on entering showed much prostration from shock and hæmorrhage. Temperature was 95·4° and pulse 100. Facial paralysis of right side was pronounced. Blood was running from the right external meatus, as well as down the patient's throat from the eustachian tube of the same side. Blood clots and disorganized tissue blocked up the external meatus, and on probing into the wound cavity, the instrument passed four and a half inches, traversing necessarily the posterior inferior wall of the tympanic cavity, a portion of the jugular bulb, the pharyngeal muscles and soft tissues. The tegmen was torn from the bone in the tympanic cavity, as indicated very plainly by the probe, and the facial nerve was lacerated by the explosion. As the patient objected to the probing, the ball was not located at this time. The *x*-ray picture seemed to indicate that the bullet was lodged behind the ramus of the left inferior maxillary. The patient's condition being good two days afterwards, viz.: on September 11th, I operated as follows: Careful palpation was made on the interior surface of the left lower maxillary especially at the ramus, but gave no evidence of a foreign body, neither could it be felt by manipulation of the soft tissues outside or inside this portion of the maxillary bone. An external opening was then made through the tissues in the external sub-maxillary triangle, which enabled me better to palpate the

structures on the internal surface of the ramus, but no success attended this manœuvre. Proceeding farther inward behind the pharyngeal muscles, I felt the bullet (a small one) imbedded in the body of an upper cervical vertebra. Having located the bullet, I separated the muscles in the oro-pharynx over the area of its impaction with the left forefinger, and with the right finger through the cervical tissues externally I secured leverage on two sides of the missile. I could not dislodge it, however, owing to the depth in which it was embedded. Further traumatism seemed unwise, so the attempt to recover it was abandoned. The patient's convalescence was without incident, no sepsis arose, and he gained strength rapidly, the only result of his destructive efforts being a right-sided facial paralysis with anæsthesia of a portion of the tongue due to injury of the chorda tympani nerve.

On considering the anatomy of the parts affected by the shot, one would think it almost impossible for a bullet to enter the tympanic cavity and tear the jugular bulb even to a slight degree without at the same time destroying a part of the carotid artery, owing to the close relations of these vessels. The hypotympanum or floor of the tympanic cavity is formed by a thin lamella of bone separating it from the dome of the jugular, and it was necessarily through this structure that the bullet passed, injuring the vein but apparently not implicating the artery, and one must infer that it was deflected from its course by the petrous bone. Cases are reported where fatal results have followed the accidental penetration of the jugular while doing a mastoid operation. A dehiscence of the bone sometimes occurs here, the tegmen being the only substance in that case separating the bulb from the tympanic cavity. Notwithstanding the fact that the force of the explosion in this case was directed partly toward the posterior tympanic wall, no lesion of the static labyrinth ensued.

NOTES ON TWO CASES OF PECULIAR MEDICAL INTEREST

I. Syphilitic Aortic Insufficiency

II. Cerebro-spinal Fever Supervening Upon (?) Erythema Nodosum

By J. C. Meakins, *Lieutenant-Colonel, C.A.M.C.*

1. Staff-Sergeant-Major T. J. S.; Reg. No. T. 9063; A.S.C.; age forty-seven.

This warrant officer was admitted to hospital on February 10th, 1918, with a diagnosis of influenza. He had served in the army since 1889, and his medical history sheet showed no illnesses of importance except malaria in 1901. He was married, having nine children, six alive and well.

Three days before admission he had a chill, followed by fever, headache, pains in the back, and a general feeling of weakness. On admission he had a temperature of 100°, respirations 18, and pulse 80. Physical examination showed no abnormality apart from the cardio-vascular system. There was conspicuous pulsation of the brachial and carotid arteries, and a distinct epigastric impulse; the pulse was regular, between seventy and eighty per minute, and of a moderately collapsing character. The blood-pressure was 150. Heart; apex beat diffuse, point of maximum impulse in the fifth interspace at 10 cm. to left of mid-sternal line. The cardiac dulness extended 10 cm. to left and 4 cm. to right. On auscultation the sounds over the pulmonary area were clear. The second sound over the aortic area was of very poor quality, and was followed by a long blowing diastolic murmur, which was transmitted down the sternum and towards the apex region, where it was less distinctly heard, and was associated with a faint systolic murmur. *X*-ray examination showed very little dilatation of the aorta; heart shadow not conspicuously enlarged.

On February 13th, 1918, Wassermann reaction was positive. On February 14th, 1918, potassium iodide and mercurial inunctions commenced. On March 7th, 1918, Wasserman still positive, but the diastolic murmur, although still present, was much less

From the Medical Division of No. 15 Canadian General (Duchess of Connaught Canadian Red Cross) Hospital, Taplow, Bucks.

distinct. The potassium iodide and mercury treatment was continued, and during April he received 1.4 grm. of galyl intravenously, divided into five doses at six-day intervals. On April 30th, 1918, the diastolic murmur had completely disappeared, and the systolic murmur at the apex was very faint, and during the ensuing week disappeared also. On May 8th, 1918, the Wassermann was still positive, but all evidence of cardiac lesion had disappeared.

The interesting point in this case is the recovery, while under treatment, of a well-marked aortic insufficiency of syphilitic origin.

2. Driver H. H. N., Reg. No. 30622; A.F.A.; age 19.

This private reported sick in France on April 12th, 1918, complaining of headache, pain in the shins and knees, swelling over the shins, and fever. He was sent to a detention hospital, where he remained for two weeks. During this time bright red circinate patches developed on the shins, forearms, and thighs. He was transferred to hospital, and evacuated to England on May 9th, 1918, diagnosed erythema nodosum.

On admission to this hospital he had pains in the small joints of the hands, in the knees and ankles, and the erythematous patches were still present on the forearms, and gave all the appearance of typical erythema nodosum. Temperature ranged from 101° to 103° F. There was pain in the joints, with some swelling of the knees and ankles and redness about several joints in the hands, particularly the left metacarpal phalangeal joints. Heart and other systems normal. On May 10th, 1918, blood count: polymorphs, 68 per cent.; large mononuclears, 16 per cent.; small mononuclears, 16 per cent.; red cells, 4,900,000; white cells, 8,700; hæmoglobin, 95 per cent. On May 15th, 1918, blood culture sterile. On May 16th, 1918, white cells 20,600. On May 20th, 1918, blood culture sterile. During this period temperature was intermittent; he had irregular and recurrent swellings of various joints, profuse sweats, and the areas of erythema developed over the legs and arms at various intervals. On the morning of May 22nd, 1918, he had a sudden onset of severe headache, vomiting, and restlessness. White blood cells, 14,500; polymorphs, 80 per cent.; large mononuclears, 9 per cent.; small mononuclears, 11 per cent. There was slight retraction of the head and considerable photophobia. Lumbar puncture showed turbid fluid, and 30 c.c. of anti-meningococcal serum were injected intraspinally. Examination of fundi was normal. During the day retraction of the head became more pronounced, and Kœnig's sign distinctly positive. Examination of spinal fluid, cell count 6,000 per cmm., cells being chiefly poly-

morphonuclear. No organisms found in smears. Examination of the eyes on May 23rd, 1918, showed the veins engorged; otherwise normal. Lumbar puncture on same date showed slight increase of pressure and turbidity; temperature was lower, and the patient felt somewhat better. On May 24th, 1918, he still complained of headache, there was slight retraction of the neck, and Kœnig's sign was doubtful. Temperature was normal; lumbar puncture revealed clear fluid under no pressure. The culture of the original spinal fluid showed a very slight growth, which on agglutination was determined to be meningococcus, Type 3. Patient made an uninterrupted recovery from the meningitis, although the arthritic symptoms and the erythema persisted for many weeks. Repeated cultures from the naso-pharynx, both during the acute stage and the convalescence of the meningitis failed to show any meningococci.

After recovery from the meningitis the following additional history was obtained from the patient: Left Australia on November 23rd, 1916, and on the transport three cases of meningitis developed, with two deaths. As far as he knows he did not come into contact with these cases. On December 26th, 1917, patient spent leave with his brother, a close associate of whom died of meningitis about this date.

This case of was particular interest in that epidemic cerebrospinal meningitis developed in a patient already suffering from a febrile illness accompanied by a pronounced rash.

AN UNUSUAL PSYCHONEUROSIS OF WAR: FUNCTIONAL LOSS OF THE SENSE OF SMELL

By Digby Wheeler, M.A., M.D., C.M., M.R.C.S., L.R.C.P.

Temporary Captain, C.A.M.C.

THE following case of the complete loss of the sense of smell as a functional condition has recently been observed in the medical wards of the Granville Canadian Special Hospital, Buxton.

Cases of aphonia, deafness, amaurosis, amblyopia, anæthesia, paresis, hemiplegia, paraplegia, etc., appearing as different psychoneuroses of war are frequently encountered, I have not as

yet seen a case reported in any of the literature of the functional loss of the sense of smell.

To physiologists this anosmia is interesting, because it demonstrates very clearly the four primary tastes. Thus a man with the loss of the sense of smell can only recognize things as acid, salt, bitter, or sweet. He is quite incapable of recognizing any of his food—in fact, has lost that fine differentiation with which *taste*, and not *smell*, has usually been credited.

718108 Pte. P., 15th C.B., arrived in France September, 1916. Carried on without any trouble until buried by high explosive shell on April 27th, 1917. He was unconscious for three hours, and recovered as they were digging him out He was sent to the Casualty Clearing Station by the M.O., after having requested to be allowed to "carry on", because he was told he was "shaky". At the base hospital on April 30th, 1917, he noticed that he could not smell anything, and his meals tasted as if he were eating so much "pine wood". May 15th, 1917, he was sent back to his unit, but his M.O. would not allow him to "carry on" at the kitchens. Here he went out one morning with two other men to bury some decayed meat. While digging the pit they uncovered two dead Germans. The others left because of the offensive smell, but he was able to stick it out and finish the job without any discomfort.

He was sent again to the Casualty Clearing Station, June, 1917, diagnosed trench fever. While at hospital this time he developed gross symptoms of shell shock, such as tremor and persistent occipital headaches.

He was admitted to the Granville Canadian Hospital on July 30, 1918, complaining of headaches, tremor, and pain in the back.

Examination at this hospital showed a well-developed, well-nourished man; heart and lungs normal; reflexes equal and active: abdomen normal; gait and station normal; eyes normal. There was marked limitation of flexion of the back, and also a fine tremor which was confined to the right leg. *X*-ray examination of the back showed no abnormality. Wassermann negative.

Examination of the Nose and Throat

Anterior nares, left: Septum markedly deviated to this side; lower turbinate enlarged.

Anterior nares, right: Normal.

Throat and posterior nares: normal.

Examination of the Special Senses of Taste and Smell

The examination was carried out with the eyes bandaged. He was given the following to taste:

(a) Sodium chloride, which he recognized as salt.
(b) Syrup glucose, which he recognized as sweet.
(c) HCl dil., which he recognized as acid.
(d) Syrup quassiæ, which he recognized as bitter.

A number of volatile substances were given to smell, such as ammonium forttis, ether, oil lemon, hydrogen sulphide, aqua rosæ, oil men. pip., none of which he recognized.

Also a selection of different articles of foods were given to taste, such as cheese, butter, cabbage, potato, beef, jam, mutton, none of which he recognized.

Method of Treatment

August 17th, 1918.—A weak faradic current was applied to the muscles of the lumbar region. Practically full voluntary flexion was restored in two minutes.

Agust 19th, 1918.—A considerable time was spent with the patient explaining his condition to him and assuring him that his sense of smell would be restored.

A strong faradic current was applied to the back of the neck, and at the same time ammonium forttis was held under his nose, and he was instructed to tell what it was. At the end of one minute he recognized it as "ammonia", and was highly pleased with himself. He next recognized oil of lemon with the aid of a weaker current.

The substances as used in the testing of his sense of smell were given again to the patient that he might identify them without the aid of the current. He identified each substance immediately.

The foods, as given in testing his sense of taste, were given again to the patient that he might identify them without the aid of the current. He identified each food immediately. The different foods were administered in combination, and the patient was able to tell accurately what he had been given.

Editorial

A FEDERAL DEPARTMENT OF HEALTH

THE announcement in the daily press that the Federal Government has determined to carry out the long-asked-for and much-promised step of establishing a Department of Health comes like a breath of cool air from the Laurentians, and it is hoped that after fifty years (ten more than the traditional journeyings in the wilderness) the prayers of the medical profession and all hygienists will be answered.

It will be news to many members of the profession that at the first meeting for organization of the Canadian Medical Association in Quebec in 1867, a strong committee was appointed of leaders of the profession to draw up a report on the subject of public health, which report fortunately is recorded in the minutes of the meeting in 1868 and signed by Sir William Hingston, chairman. It will be further still more interesting to know that by order-in-council a conference was held in Ottawa, in March, 1866, of nine physicians who prepared a memorandum on cholera signed by Dr. MacDonnell, chairman, and Dr. Taché, secretary. To the younger members of the profession it must seem amusing to quote its opening sentence, "To make use of the happy expression of M. Tardieu, 'It is well to bear in mind that pestilential diseases are not of that class of which it has been given man to penetrate the origin and to understand the principle.'"

Resolutions of committees urging a Department of Health were adopted yearly for several years after 1868, and in 1894, Dr. Brouse, M.P., for Brockville, introduced a bill into the House of Commons for its establishment. A series of articles appeared in the *Montreal Medical Journal* from 1871–1874

which presented in the clearest way the generally accepted views both of the profession and of the legislators of that time as to the functions and duties of the Federal Government in the matter of public health. The writer, probably Professor Fenwick, urged that action be taken by parliament that session, otherwise, as a political change in the Government was pending, it might mean years before the House would again be educated up to the point of taking action. So it happened that for nearly ten years there does not seem to have been an active interest shown in the matter either by the Association or parliament. Apparently the profession was weary with asking in vain.

But public opinion in matters of health was growing, for 1882 saw the first Provincial Board of Health in Canada established in Ontario. Primarily appointed to deal with epidemics and statistics through encouraging municipal councils to organize health committees, the executive of the Board soon found that progress was impossible without compulsory local boards and a public health act. Such an Act was passed in 1884 based upon the English Heaith Act of 1875. Quebec followed with a "*Conseil de Santé*" in 1886, the year after the great smallpox epidemic, while Manitoba and the other provinces have followed, until now each has some organization more or less developed. It is probable that it is to this action taken by the provinces that we must look for an explanation of the seeming inaction of the profession and of the changing attitude of the Federal Government as regards a Federal Department of Health. The provinces and the quarantines were in some measure protecting the public health; while the minutes show that the Canadian Medical Association had begun to be more particularly interested in medical education and in unifying the practice of medicine for all Canada.

With the incoming of the twentieth century, however, the progress of the exact sciences in their application to medicine had become so great that preventive medicine

began to receive more consideration; while the public had become educated along with the profession in the belief that tuberculosis was preventible, that infant mortality was a matter largely of personal hygiene, that correcting the defects of children was based upon their inspection in schools, and that district health nurses and sanitary house inspection were becoming essential factors in the social progress of every community.

Thus the time had arrived, with the great increase of population, through immigration doubling urban populations, with an unassimilated mass of new-comers of diverse nationalities, when the knowledge of what must be done began to resolve itself into the problem of:—Who should do it? Municipal Health work had been brought into touch with and guided by provincial legislation, but the provinces continued to stand apart without any health relations with the National Government, although the latter was responsible for the ingress of a population upon whose physical, mental, and moral welfare must depend in large measure our social status. So it will be found that at almost every annual meeting of the Canadian Medical Association since 1901, reports were adopted outlining in the clearest manner the views of the profession as to what the scientific, social, and economic needs of the country demanded on the part of the Dominion Government. Deputation after deputation waited upon the Government and then only was the fiction of constitutional difficulties in legislation set up, to be excused only on the ground of a lack either of knowledge or of appreciation of the situation. A similar situation had prevailed elsewhere; but with increased responsibilities, even in the United States where the theory of sovereign States rights had prevailed for a century, a Public Health Service in 1903 with large appropriations was developed to meet the needs, not only of their new possessions but of coast quarantines, immigrant inspection, and the promotion of public health in all matters relating to interstate health.

With 1914 came the war which has caused in all matters a rapid revolution in our thinking, and in nothing so much as in the realization that the man-power of a nation underlies every question affecting its present and future efficiency. In the United States this year finds $4,000,000 devoted through special legislation to the protection of the soldiers and public against the dangers from social diseases. England has a bill being introduced to Parliament to unify all public health services under one Department of Health with its Cabinet Minister, while the splendid work of the Canadian Army Medical Service has shown that in no particular is medicine in Canada behind that of the other Anglo-Saxon allies. It would indeed be playing false to our splendid overseas record and to our future at home, in view of all the needs now and of the expected tremendous national demand which our rapid national development will force upon us, if Canada does not unite her whole energies in caring for a people who, whether abroad or at home, have proved themselves worthy of the high position now accorded them of a nation amongst nations.

By means of teamwork on the part of specialists the Medical Department of the United States Army has now erected a dependable line of defence against empyema, which assumed the proportions of an epidemic in the American camps last winter, the virulence of the germ is such that the infection is always to be dreaded. Surgeon-General Gorgas ordered special investigations to be made. Following this the cause was discovered by an intensive study in the laboratory divisions of bacteriology and pathology. The surgical division was charged with the problem of devising the best method of treatment. A special group consisting of surgeons, internists and laboratory workers, was located at Camp Lee, Va., where a large group of patients were available for study. At the same time empyema teams, con-

sisting of a surgeon, a medical man, and a laboratory expert, were appointed from the staff of each base hospital to treat and make a special study of all cases at their particular hospital. The treatment carried out by the Empyema Commission consists of removing the pus by aspiration at as frequent intervals as necessary. It was proved that the virulence of the exudate usually decreased during the periods between aspiration. In other words, nature herself seems to take a hand. The best time to operate is when the patient begins to improve. A local anæsthetic is generally employed; means are taken to prevent collapse of the lung. Many ingenious devices have been introduced. In one ward filled with patients suffering from empyema the entire group of draining abscess cavities were attached by tubing to a central suction pipe so as to keep the pus sucked out and the lungs of the patient expanded. The following figures demonstrate the effectiveness of the new technique of treatment. From October to January (20th and 29th), eighty-five cases were under treatment which were not aspirated; of these fifty-two died. From January 29th to April 30th, sixty-nine cases were being treated; all of these were aspirated. The deaths numbered six.

The American Red Cross Research Society in Paris has received an announcement from Major Pilcher that a cure has been found for gas gangrene. Quino-formol is what the new solution is called and it is compounded of quinine, acetic and hydrochloric acids, and formalin, thymol and salt. It is said that it has the advantages of simplicity of preparation, stability and portability. It is suitable for the initial treatment of wounds at dressing stations or evacuation hospitals. Recent tests of quino-formol, made at the Auteuil hospital, showed just one failure, and not a single amputation was performed in six weeks. Undoubtedly a record since the beginning of the War. There had been an influx of seriously

wounded soldiers. Application of the solution is identical with that prescribed for use of the Carrel-Dakin treatment which has been often used in conjunction with quino-formol.

The American War Department have had, during the last six months, plans under advisement to check outbreaks of lobar pneumonia, and have issued a statement from the office of the Surgeon General that vaccination against pneumonia will be given weekly to officers, enlisted men, and civilian employees of the Surgeon General. All who appear will be volunteers. The vaccine used is a Lipo vaccine prepared at the Army Medical School. It is given in a single injection and contains pneumococci of three types (I, II, and III). Reactions are, as a rule, less pronounced than after antityphoid vaccination. Experiments with the vaccine have been progressing satisfactorily for some time. Vaccination against pneumonia has been given in two of the Army camps. At Camp Upton, last winter, during the ten weeks from the period of vaccination until the troops went overseas, no cases of pneumonia, due to the three types of pneumococcus protected against, occurred among the vaccinated troops. About 10,000 troops, all volunteers, were vaccinated. The incidence of pneumonia from other organisms was only one tenth as high among the vaccinated as among the unvaccinated, although previous to vaccination the incidence of pneumonia had been equal in the two groups.

The rebuilding and re-equipment is planned of the St. John's Ambulance Brigade Hospital, destroyed recently at Etaples by the German bombardment. It was left in a state of absolute ruin which necessitated its immediate evacuation, but the military authorities desire its re-erection in France on another site. As this will entail very heavy

expenditure the Order of the Hospital of St. John of Jerusalem has sent out a direct appeal from headquarters. Already the Victoria branch has forwarded a cheque to England and the support of various branches throughout Canada has been solicited. Newfoundland is making a special appeal; it has already supported sixty beds at the Etaples hospital from its famous "Cot Fund", which endows beds in hospitals already existing and which requires $50,000 annually for its upkeep.

Correspondence

EDITORIAL ERROR IN PUBLICATION OF LIEUTENANT COLONEL BIGGAR'S LETTER

We very much regret an error in connection with the publication of Lieutenant-Colonel Biggar's letter in our November issue. The official title of his present position was added below Colonel Biggar's signature without his authority. The letter was an expression of Colonel Biggar's personal opinion, and did not emanate from, nor was it written on behalf of the Board of Pension Commissioners. The description of his official position was added below the signature by the Editors of the Journal.

Obituary

DR. FRANK FAIRCHILD WESBROOK

In the death of Dr. Wesbrook on October 21st, the University of British Columbia loses its president and the medical profession one who had a distinguished scientific career before he devoted himself entirely to educational work. Born in Brant County, Ontario, in 1868, he graduated in Arts and Medicine at the University of Manitoba. Later he studied abroad in Cambridge, London, Dublin, and Marburg. For a time he was Professor of Pathology and Bacteriology in the University of Manitoba, and in 1895 was appointed to the corresponding professorship in the University of Minnesota, which he held until 1913. He was Dean of the Medical School from 1906–13. His work in public health was recognized as of the best. For many years he was Director of the laboratories and a member of the Minnesota State Board of Health. In 1913 he was appointed President of the University of British Columbia and threw himself with energy and enthusiasm into the heavy work of organization of a new institution.

He belonged to many societies both on this continent and abroad and among other honours had been President of the American Public Health Association and of the section on State and Municipal Hygiene in the International Congress of Hygiene. He was Chairman of the Provincial Committee on Food Resources. The Universities of Manitoba, Toronto, and Alberta had conferred the degree of LL.D. on him.

It is not usual for college presidents to be chosen from the medical profession. Undoubtedly Dr. Wesbrook's powers of organization and his ability in administration had much to do with the choice. The war added to his difficulties and interfered with the programme of development which had been planned. The writer spent a day with him in Vancouver in 1915. He was full of enthusiasm and of hopes and plans for the new University, but always came back to the question as to how he could best help with the war. There have been few men with a more cheering and attractive personality. It was always a pleasure to have a

visit from him and he was as much interested in the work of other men as in his own. For many of us his passing means the loss of a good friend. The profession has lost one who did splendid work especially in investigation in bacteriology and health administration. A young University has lost a leader who, had he been spared, would have done much to establish an institution useful both to British Columbia and to education in general.

T. McC.

DR. CHARLES EDGAR HOLBROOK

THE medical profession of Montreal has suffered severe loss by the death on October 18th, at the Royal Victoria Hospital, of Dr. Charles Edgar Holbrook.

Dr. Holbrook, who was in his thirty-fifth year, was born at Ogdensburg, N.Y., and entered McGill University with the medical class of 1908. After graduation he received an appointment as interne in the Montreal Maternity, which he held for a year, and subsequently served for some months in the Montreal General Hospital. Later he obtained an appointment in the Woman's Hospital in Baltimore, and on his return to Montreal in 1913, he again became attached to the staff of the Montreal General Hospital. With the outbreak of war the superintendency of the Montreal Maternity became vacant, and Dr. Holbrook took the post, remaining till July, 1916, when he obtained an appointment in the Royal Victoria Hospital, to which institution he was attached at the time of his death.

Few young men combine the personal qualities and the training which he possessed, and to recent graduates of McGill University his death will come as a great shock.

Though his exemption could have easily been secured from the draft, Dr. Holbrook felt called upon to offer his services for the war, and took his place in the draft, his commission as a lieutenant in the United States Medical Corps being received on the day he entered hospital.

Dr. Holbrook was to have been married on October 16th to Miss Kathleen Cains, superintendent of the Montreal Maternity. The wedding was at first postponed on account of his illness, but later, when his condition became more grave, both insisted that the marriage should take place, and the ceremony was performed in the hospital on the Monday prior to his death. The sympathy of the profession goes out to Mrs. Holbrook.

DR. ELISHA JESSUP

After an illness of a critical nature, Dr. Elisha Jessup, member for the county of Lincoln in the Ontario Legislature for over twenty years, died at his home in St. Catharines, on October 24th. For some months back he had suffered from heart trouble, and about ten days previously was taken ill with influenza, but was recovering when he was seized with an attack of heart failure, and gradually sank into unconsciousness. He was born in Norfolk County, England, and came to this country at an early age. In 1870 he graduated in medicine from the University of Toronto. As a young man he practised medicine in Jordan for twelve years and then removed to St. Catharines, which has ever since been his home and the scene of his medical and public activities. His death removes from this city and district a familiar and interesting personality. He held an immoveable position on the stage of local politics, his majority, in more than one instance in electoral contests, running far above a thousand. He was a strong Conservative and adhered constantly to that party, yet because of his unusual characteristics he held a large vote among the Liberals. In the election of 1911 he was returned by acclamation. But it was as the "family doctor" that the late member established his widest influence. He was a sort of paternal physician in the community, to whom were entrusted many family secrets and troubles outside those of physical illness. This was the key in fact to his remarkable success at the polls. He was a plain man with plain words, who understood well the plain people, who always had their best interests at heart, and tried to interpret their ideas and needs in simple speech and methods. He leaves behind him a fine record; seventy-five years spent in the service of the people.

DR. J. P. RUTHERFORD

The death of Dr. James P. Rutherford, on October 24th, at Chatham, removes one of the pioneer medical men of this section. He was born at Richmond Hill, York County, in 1844. He graduated in medicine from Victoria University, Cobourg, at the age of twenty-three. For ten years he practised in Kent County, at McKay's Corners. He then removed to Chatham, and for more than half a century he has cared for the sick in this section and built up a very large practice. His genial nature won him many friends. In 1888 he became mayor of the city. Among the

first to take up surgery he established an exceptional reputation in this work, in which he was highly successful. He practised until last February, when he retired. He leaves a wife and two sons, both residing in Chatham, and both following their father's profession.

At his residence, Petrolia, on September 20th, Dr. Robert S. Macalpine, long a familiar and beloved figure in the community passed quietly away. His gentle influence for the good of others, in the town and surrounding country will be greatly missed. Sterling of character, he was strongly relied upon and was found unfailingly dependable. In the home, in the church, and among his numerous patients his care and consideration will never be forgotten. Unostentatious, honourable, conscientious, the whole community is bereaved in the loss of such a man. He is survived by two daughters and an only son, now on active service in France.

Dr. John MacKenzie, one of the best known physicians in Nova Scotia, died on October 12th, at Pictou, from pneumonia following Spanish influenza. He was the health officer at Pictou and attended a meeting of the board shortly before his death. He was a son of Dr. George MacKenzie, who for many years practised in Pictou. He graduated in medicine from Dalhousie University.

With deep regret the announcement is made of the following names of members of the profession who died very suddenly from influenza and pneumonia during the recent epidemic. Dr. Turcotte, Nicolet; Dr. C. W. Graham, Goderich; Dr. L. G. Pearce, Brantford; Dr. H. R. Barker, Sharbot Lake; Dr. E. M. Lambert, Ottawa; Dr. Henry Lockhart, Cowansville; Dr. J. C. Saint Pierre, Montreal; Dr. Romulus Falardeau, Montreal; Dr. C. E. Dubuc, Montreal, Dr. W. Halpenny; Montreal; Dr. Stanilaus Briscon, Chatham; Dr. F. St. Jacques, St. Anne des Plaines.

The following list briefly chronicles the deaths of late member of the medical profession in this country who promptly responded to the call of duty in the recent epidemic of Spanish influenza, and whose untiring efforts, courage, and ceaseless self-devotion have cost them their lives The brief report emphasizes the fact that deeds of heroism leading to martyrdom are not confined to the battlefields. Dr. A. S. Lovett, Paris, Ontario; Dr. H. B. Andrew,

Sunbridge; Dr. A. W. Stinson, Cobourg; Dr. R. W. Faulds, Elmira. Dr. James Ewart Brown, Toronto; Dr. Osler M. Groves, Carp, Carleton County; Dr. Gordon Brown, Danville; Dr. James L. Stapleton, London, Ontario; Captain (Dr.) T. R. Guilfoyle, C.A. M.C., Whitley Camp, England; Dr. Rosseau and Dr. Duggan, Saskatchewan.

Correction of error in November issue:—

Under the obituary notices in the November number the death of Dr. Thomas S. Cullen of Baltimore, was erroneously reported. The notice from which the information was taken, no doubt, should have referred to the death of Mrs. Cullen, who was for many years the devoted wife and co-operator with Dr. Cullen in both his civic and professional duties. She died of a cerebral cyst last September.

Miscellany

News

MARITIME PROVINCES

Lectures in the Medical Faculty at Dalhousie University were begun on October 1st.

The entrance into the First Year of Medicine was exceptionally large; amongst others entering there, were several who returned from the War to complete their medical studies.

Owing to the outbeak of influenza in Halifax and the province of Nova Scotia, the university was closed on the suggestion of the Board of Health for the city of Halifax from October 7th until further notice.

As soon as it became known that there was a shortage of doctors in Boston to control the epidemic of influenza there, Drs. J. G. MacDougall, Lewis Thomas and J. F. Lessil went to that city from Halifax. On their return they published a valuable announcement dealing with the character and prophylaxis of the disease. A number of nurses also went from Halifax to Boston to assist in combating the scourge.

MANITOBA

According ot the report recently submitted to the city council the past year has been the busiest in the history of the Winnipeg Municipal Hospital. The expenditure shows a total outlay of $287,698, against expropriations amounting to $287,952. The revenue from patients' accounts amounted to $16,768, which reduced the total expenditure to $270,698. There were 1,782 patients admitted to the hospital during the year, with 232 carried over from the previous year. The report concludes by saying the most serious problem facing the hospital at the present time is the shortage of nurses, a situation created by the demand for nurses for army service.

The Newdale Consolidated School and four other large schools in the district were closed in the month of September on account of an outbreak of infantile paralysis. A large party of blind children, gathered from the West, were despatched east to be enrolled as pupils at the Ontario Institute for the Blind at Brantford.

ALBERTA

The annual convention of the Alberta Medical Association was held on September 25th, and continued three days. The meetings were held in Edmonton at the University of Alberta. The following officers were elected for the ensuing year: President, Dr. G. A. Anderson, Calgary; first vice-president, Dr. F. W. Gershaw, Medicine Hat; second vice-president, Dr. G. H. Ingraham, Delia; secretary-treasurer, Dr. A. Fisher, Calgary. Next year's session will be held in Calgary.

Important resolutions were passed in regard to the prescribing of alcoholic liquors This action on the part of the medical men was taken after a serious discussion of a communication received from the attorney general's department, requesting the co-operation of the profession in enforcing the Liquor Act, and also the Act governing the sale and administering of narcotic drugs. All of the doctors at the meeting were unanimous in their determination of backing the government in this way. The resolutions of the association provided for a limit of eight ounces in any prescription, a similar limit on the quantity to be kept by a doctor for the requirements

of his own practice in places where a vendor is established, and the sale of medicinal liquor in sealed bottles only. In the resolution, the members of the association recommended that the name and address of the party to whom a prescription is issued be placed upon each prescription, so that information will be available to show whether the liquor is used for legitimate purposes and by the proper party. It was also recommended that the government should make careful inspections through the province at regular intervals.

A RECENT order-in-council has transferred the whole health department of the province of Alberta to the charge of the Honourable A. G. MacKay, the new minister of municipalities. This department was organized and was formerly in charge of Honourable George P. Smith, but with the change in the cabinet he now takes over the department of education, and the department of health has been placed with the department of municipalities. It has been considered that the two departments can work together under the same head with advantage, since each require much of the same detailed information. With regard to the municipal hospital Mr. MacKay sounds a note of warning. He thinks that the hospital areas may be too small for safe financing. "Nothing," he says, "more unfortunate could happen than the establishments of small districts with heavy assessments and lack of funds with which to run the hospital so as to give first class service. The minister states he will not establish a district unless he is absolutely satisfied that it is in a sufficiently strong financial position to give this service when it is built. He is also very decided on the matter of boundaries being arranged so as not to leave any small territories stranded in between districts.

OWING to the financial difficulties of the Calgary Hospital the commissioners have drawn up a report to the city council recommending that a supplementary grant be made to the hospital of $17,000 to enable it to carry on its work for the balance of 1918. The understanding between the hospital board and the city is, however, that whatever provincial grants may be earned by the hospital during the last six months of 1919 are to be credited to the estimates of the city. This means a grant of $8,000 and an advance of $9,000, since the hospital's estimate that the twenty-five cents per day per patient which is paid by the provincial government will in six months total between nine and twelve thousand dollars.

SASKATCHEWAN

A MOVEMENT to improve the health of the nation has been inaugurated by several of the city councils of western cities, led by Saskatoon. Startled by the revelations as to the average standard of physical fitness of single men as shown by military records, they have drawn up resolutions regarding the matter, urging on the Provincial and Dominion Governments the advisability of taking advantage of the records filed by the military authorities as a result of the examinations made. Vancouver and other cities have considered a letter sent out by the City Council of Saskatoon asking for their co-operation in urging the governments to action and have endorsed the resolutions. A communication has been received from Premier Borden stating that the petition had been considered in council, and that the minister of militia and defence had been instructed to prepare a report which would be submitted in council. The letter concluded: "The minister of militia informs me the results of examinations are available in all cases of men who have been rejected, and that he will be happy to place results of the medical examinations at the disposal of the governments in each province in order that any action which the department of public health in each province may think it desirable or possible to take may be taken."

UNDER the new régime adopted by the medical authorities at Ottawa, the services of practically all medical officers known as part time men will be dispensed with, and full time men, or officers who under straight pay of rank are willing to devote all their time to military work, are being substituted. In putting the order into effect several part time officers in Regina, and various parts of Saskatchewan, are being dropped and return to civilian practice only. It will finally mean that twenty-four part time officers will be let out, and ten full time officers will be secured to carry out their work. At the present time eight civilian practitioners are on duty. This number will be reduced to three who will be permanently engaged. The three are special senses consultants, one in each of the three cities, Regina, Moose Jaw and Saskatoon. Eventually twenty-seven full time officers will be doing military work in the A.D.M.S. department in M.D. 12. Under the old routine forty-six medical officers were on the strength of the department, including the part time men. The officer in

command is Colonel E. D. Davis, C.M.G., and the deputies are Captain G. O. Wood, C.A.M.C., and Captain A. C. Scott.

Dr. J. Gordon Wright, late superintendent of the Kingston General Hospital, has been appointed medical superintendent of the Regina Medial Hospital to succeed Dr. Dakin whose resignation went into effect on September 1st. The appointment was made by a special committee of the board of governors, their action being endorsed unanimously at a later meeting of the general board. Dr. J. Segal has been appointed medical superintendent of the Earl Grey Sanitorium replacing Dr. L. G Hoole, who has been transferred to the Tranquille Sanitorium in Kamloops.

Great progress has beem made in the Moosomin and Watrous districts in inaugurating the plan for school nurses. The Honourable W. M. Martin is making plans for a wide extension of the work. He is to ask the next session of the legislature to provide sufficient funds for the appointment of at least twelve new school nurses during 1919. There are forty-one inspectorates in Saskatchewan.

ARMY MEDICAL NEWS

The King recently invested with the Distinguished Service Order, Majors Tyeo and Lomer, medicals.

The Military Cross has been awarded to Captain Walter Mingie, C.A.M.C., of Montreal.

Six Canadian nurses have been gazetted for the Military Medal for bravery during air raids: Nursing Sister Edith Campbell, Pointe Clare; Nursing Sister Lottie Urquhart, New Glasgow; Nursing Sister Janet M. Williamson, Greenvale; Nursing Sister Meta Hodge, Hamilton; Nursing Sister Leonora Herrington, Napanee; Nursing Sister Eleanor Jean Thomsin, Valleyfield, Quebec.

Nursing Sister Spaulding was recently invested by the King with the Order of the Royal Red Cross, at Buckingham Palace.

Amongst a number of others the name of Nursing Sister Caroline G. Green, of St. Thomas, has been brought to the notice of the Secretary of War for valuable services rendered.

Captain William Givens, C.A.M.C., of Toronto, has been awarded the Military Cross. He maintained First Aid post for two days under intense fire.

Captain Benjamin Lyon, C.A.M.C., of Kingston, has been awarded the Military Cross. He followed a cavalry charge on foot, attending the wounded.

The following officers have returned to Canada: Colonel J. T. Clarke, Lieutenant-Colonel J. F. Kidd, Majors K. F. Rogers, L. J. Rhea, A. S. Langrill, S. S. Skinner, Captains C. G. Imrie, J. H. Fisher, G. B. Wiswell, D. G. Elliot, M. J. Gibson, W. S. Atkinson, C. B. Trites, W. J. Donswell, A. W. Park, J. T. Mulvey, N. J. Amyot, J. G. McCammon, C. D. Rilance, G. S. William, S. Trayner, W. A. Harvey, N. T. Beeman, T. Gaddes, A. J. B. Hebert, G. A. McPherson, H. W. Byres, C. Howson, J. C. Calhoun, W. E. Ainley, J. J. White.

Promotions (Overseas): To be Lieutenant-Colonels: Majors G. S. Mothersill, W. A. G. Bauld, A. L. Johnson, F. H. Mackay, F. A. Young, N. V. Leslie, W. G. Turner,

To be Majors, C. E. Anderson, E. L. Pope, H. G. Wood, H. K. Bates, W. L. Mann, W. J. E. Mingie, J. Seager, F. E. Pettiman.

To be acting Major: Nursing Sister A. G. Hogarth.

Promotions (Canada): To be Major while acting as D.A. D.M.S. (Regina) Captain G. O. Wood.

Appointments: Major Charles McMane becomes A.D.M.S. at Quebec in place of Major G. A. Winters who has joined the Siberian Force.

Captain A. F. Menzies has been appointed cholera expert for the Siberian Force.

Major F. A. Cleland has been appointed senior surgeon of the Siberian Force.

Captain P. H. Desnoes becomes chief surgeon at the Fredericton Military Hospital.

Dr. Starr has been appointed one of the consulting surgeons to the British force in France.

CASUALTIES

Killed in Action

W. R. Thompson, C.A.M.C., Vancouver.
S. A. Kilpatrick, C.A.M.C.
C. E. R. Hall, C.A.M.C., Vancouver.
A. Evans, C.A.M.C., Petersville, Nova Scotia.

Killed in Action—Continued

T. V. G. Nickson, C.A.M.C., St. John, New Brunswick.
D. Patton, C.A.M.C., Calgary.
W. R. Pringle, C.A.M.C., Stella, Ontario.
Sergeant G. R. Matthew, C.A.M.C., Sawyerville, Quebec.
J. H. Gostin, C.A.M.C., Montreal.
N. Jarvis, C.A.M.C., Winnipeg.
D. Heath, C.A.M.C., Campbellford, Ontario.

Died of Wounds:

Captain Allan Parker, M.C., C.A.M.C., Humber Bay, Ontario.
James Reid Locke, C.A.M.C., Montreal.
P. Penfold, C.A.M.C., Winnipeg.
J. Hoyle, C.A.M.C., Montreal.

Died on Active Service:

Nursing Sister Miriam Baker, Winnipeg.
Nursing Sister Matilda E. Green, Harmsworth, Manitoba.

Died at Sea

Lieutenant William McLaren McLeod, C. A.M.C., Montreal.
Dr. C. Dickinson Hamilton, C.A.M.C., Ottawa.

Died

Captain W. C. H. O'Donoghue, (medical officer of Siberian cavalry detachment), Westport, Ontario.
Captain (Dr.) Arnold Grisdale, C.A.M.C., Niagara Camp.
Captain W. Luton, C.A.M.C., St. Thomas, Ontario.
Captain C. H. Smith, C.A.M.C., Montreal.
Nursing Sister M. Moherly, Vancouver.
J. Haas, C.A.M.C., Minot.
P. Nielson, C.A.M.C.
F. Wheeler, C.A.M.C.
T. Fowler, C.A.M.C., Montreal.

Wounded

Captain F. Day, C.A.M.C., Pictou, Nova Scotia.
Captain M. Morrison, C.A.M.C., Ottawa.
Captain A. Argue, C.A.M.C., Carp, Ontario.
Captain N. Little, C.A.M.C., Trenton, Ontario.
Captain Cameron, C.A.M.C., Port Rouge.
Nursing Sister V. Hennan, Saskatoon.
M. Matheson, C.A.M.C., Tiverton, Ontario.
J. B. Jarnason, C.A.M.C., Manitoba.
H. Rodgers, C.A.M.C.
P. Moore, C.A.M.C., Brantford, Ontario.
T. Trepanier, C.A.M.C., Sherbrooke.
W. Gordon, C.A.M.C., Ford, Ontario.
Sergeant J. Wall, C.A.M.C., Goshen, Nova Scotia.
A. W. Dykes, C.A.M.C., Montreal.

Book Reviews

The Canadian Medical Week, Hamilton, May 27th—June 1st, 1918. Published under the auspices of The Ontario Medical Association. 338 pages. Price, $3.00. Publishers: The Macmillan Company of Canada, Ltd., at St. Martin's House, Toronto, 1918.

If anyone had any doubts whether there were such things as Canadian Medicine and Canadian Surgery, a glance through this volume would scatter his doubts forever.

As might be expected, there are some valuable papers by our colleagues from the great Republic to the south, but the volume before us is a fine example of the results of clinical research and observation by purely Canadian investigators. The papers strike one as the outcome of the careful thought of men speaking from first hand knowledge of their respective topics. The two papers on Asthma—the one by Dr. Chandler Walker, "A Clinical Study of Four Hundred Patients with Bronchial Asthma," and the other by Dr. Isaac A. Abb of Chicago on "Asthma in Infancy and Childhood"—are particularly helpful.

Naturally the problems of venereal diseases are attacked with boldness tempered by common sense. Dr. H. W. Hill's phrase—

"Syphilis, the Kaiser of diseases," ought to live for several reasons. Although the causes of both tuberculosis and syphilis are known, and although both diseases are curable, the former by perfect ventilation, the latter by perfect conduct, it is "a long, long way" either to that physical or to that moral Tipperary respectively.

The articles on nerve lesions and psychic disorders arising out of the War are admirable and timely.

It is almost ungracious to point out a singular verb and a plural noun in the sentence from the official programme on the title page. Most fittingly there is a list of graduates and undergraduates of the various Canadian universities who have given their lives in the great struggle of light and freedom against darkness and tyranny.

Very fittingly the simple and pathetic lines "In Flanders Fields" are reproduced, lines sufficient themselves to destroy once and for all the widespread misbelief that a man of science cannot also be a poet.

D. Fraser Harris.

Medical Contributions to the Study of Evolution. By J. G. Adami, M.D., F.R.S., F.R.C.P. 361 pages with illustrations. Publishers: Duckworth & Co., 3 Henrietta Street, Covent Garden, London, W.C., 1918.

Dr. Adami has brought together in this volume a valuable collection of addresses, studies, and essays on adaptation and heredity in their relation to disease. The first part of the book consists of the Croonian lectures delivered to the Royal College of Physicians, London, June, 1917. Among the special topics, treated with characteristic lucidity, may be mentioned the potential variability of bacteria; the biophoric concept, a physicochemical theory of evolution; habit of growth, a law of habit or progressive adaptation; classification of tumours; and the paradoxical phenomenon of anaphylaxis or sensitization of the host by a first injection of foreign proteins which induces, after an interval of a week or ten days, an anaphylactic state of hypersusceptibility to a second injection of the same proteins, the exact reverse of immunity.

Much interesting sidelight is thrown upon obscure passages in medical experience, and the salt of theory is added to the routine of practice.

A. W.

Medical Societies

MONTREAL MEDICO-CHIRURGICAL SOCIETY

The eleventh regular meeting of the society was held March 1st, 1918, Dr. A. E. Garrow, president, in the chair.

Pathological Specimens: Series by Dr. Horst Oertel.

1. This specimen is a very extensive case of fat necrosis of the pancreas. It will be seen that practically a complete sequestration of the pancreas has occurred and there is nothing left of it except tinder-like shreds of tissue which occupy the omental bursa; in other words the fat necrosis has become so extensive as to involve and destroy the whole of the pancreas. But it has extended further into the surrounding omental and mesenteric fat tissue and a great deal of this has completely liquified so that at autopsy it formed an almost purulent looking mass. Such an extensive condition is uncommon, although not unknown. The case occurred in Dr. Keenan's service at the Royal Victoria Hospital, who had already made the clinical diagnosis of fat necrosis of the pancreas on the admission of the patient. It is interesting that in this, as in most of these cases, there also existed gall stones, but we have been unable to find any obstruction of either the bile ducts or the duct of Santorini. If you turn up the stomach and reflect it in this specimen you will see well the empty omental bursa but for the shreddy remains of pancreatic tissue.

2. The second specimen is one which represents an interesting lesion in an infant which died almost immediately after birth, having hardly breathed. It came to use from the Maternity Hospital. Here is the whole of the thorax into which two windows have been cut and it will be seen that on the left side there is a large diaphragmatic hernia through which have passed many loops of gut and also the greater part of the left lobe of the liver. There has been an almost complete twisting of the heart to the right side so that the vessels of the heart are displaced and kinked. Very little is to be seen of the left lung which is just visible in the upper part of the thorax. The hernial opening is covered by a loose, fine,

fibrous membrane which may be peritoneum, but is more likely a loose tendinous portion of the diaphragm. The gut and liver were covered by this membrane in the pleural cavity. There can be little doubt that the lesion is a developmental one. It is unusually large.

The anatomical findings demonstrate that life could not be compatible with these circumstances and the child therefore died as soon as it was severed from the nutritive connection with the mother:

Discussion. Dr. A. D. Blackader: I would like to ask if the sudden death was due to the condition of the heart, because a good many cases are reported of diaphragmatic hernia into the lungs having existed for some time, and was it the condition of the heart in this case which gave rise to this sudden death.

Dr. Maude E. Abbott: Was there any defect in the pericardium?

Dr. H. Oertel: As far as Dr. Blackader's question is concerned it is true that diaphragmatic hernias are by no means very infrequent. They result from lack of proper separation of the pleural cavity from the abdominal cavity. Many are compatible with life and even unrecognized until autopsy, as we also find it at times in peritoneal-pericardial hernia. Some years ago I autopsied a man well over middle age in which several loops of intestine were found in the pericardium. In this case, however, several conditions would appear to make it impossible for life to go on, the diaphragmatic hernia was so very large and complete that not only a great part of gut but a good portion of the liver passed into the pleural cavity. By this means aeration of the lung was made impossible and the lung remained really as a fœtal gland in the upper thorax. There is a similar lack of lung expansion on the right side as heart and blood vessels were moved over and in addition kinking of the large heart blood vessels must have been a tremendous impediment to circulation. As far as the pericardium is concerned it is quite intact, well formed, completely separated from the pleura and from the diaphragm. Whether there is a malformation of the heart itself we have not as yet determined, as the specimen is still intact.

Papers: "Polya's Operation in Gastrectomy for Garcinoma. With report of three cases," by Dr. E. M. von Eberts. (Published in this issue.)

Discussion: Dr. A. E. Garrow: The original operation, as proposed by Polya, has many technical difficulties in the perform-

ance of it. Dr. von Eberts made the statement that one great advantage was that it could be done as a one-stage operation. I think personally that that is its weakest point, because we are called upon to operate on these cases often when their condition is very poor; the patient has been starving for weeks, probably for months. The growth on examination may be not very large and quite removable but the patient's condition is such that they cannot withstand a partial gastrectomy. These cases can be tided over by a rapid gastroenterostomy, or a posterior operation which does not limit a subsequent gastrectomy. That is one of the criticisms I have to make, that it interferes with the simple problem of providing drainage for the stomach and giving the patient an opportuntiy to feed up for two or three weeks. The second objection is a technical difficulty. In performing the operation for cancer, particularly where he follows the so-called Hartman lines, to draw this section of the stomach through the transverse mesocolon and to stitch th[illegible] for at least three quarters of an inch outside this incision is a very difficult matter. I have tried it several times after having cut the stomach to see if I could do it and I could not bring the transverse mesocolon up to that point. Where the stomach is very markedly dilated that can be done. To overcome this difficulty some have recommended another modification, that is, partially close half or a third of the section and then to do an anastomosis with the lower part. You have the same difficulties and the same dangers to contend with that Bilroth had in his anastomosis of the duodenum. The modification referred to as having been carried out in the Mayo Clinic has a good many difficulties, particularly doing the anterior gastroenterostomy and does not present any of those more serious difficulties to my mind which the original Polya operation had. One trouble that seemed to me rather difficult to overcome was that after dissection of the stomach, as recommended by Polya or the Mayo's modification, to put on a second clamp. After having sectioned the stomach by means of the cautery and taken off your Polya's clamp and then to put a second clamp in behind in order to get the anastomosis, that is rather difficult, particularly in the case in which Dr. von Eberts performed it where he had made the section transverse and very high; it must have been difficult to get the stump of the operation closed. It seems to be the ideal operation nevertheless by that third method, bringing the jejunum over the transverse colon and in through the transverse mesocolon and simply performing an antero-gastroenterostomy.

In connection with this subject I want to show a very extensive cancer of the pyloric antrum which has several very interesting features: The patient was a young man aged twenty-five, and had no symptoms other than vomiting, loss of weight and strength. He had applied to the Aviation Corps and had been accepted last October and the history only goes back three months. In performing the operation I made a resection through the lines of the œsophagus vertically downwards and instead of attempting the Polya operation made an antero-gastroenterostomy in this position. The objection to that, as pointed out by Dr. von Eberts, does not hold so much in the anterior as in the posterior, the danger of cutting off the blood supply and having necrosis or leaking of your anastomosis of leaking of your line of section. I think, however, that with improved technique, that Polya's operation in partial gastrectomy will in suitable cases where the patient's condition is such that the complete operation can be done in one stage, will be the operation of choice, it has so many features to recommend it and particularly that in neither of these three cases had Dr. von Eberts any post operative vomiting and in an extensive resection such as he carried out it is one of the most important things that you are able to begin to feed your patient early.

Dr. E. M. von Eberts: With regard to the question of deciding whether it should be a one or a two-stage operation, the two-stage operation should be performed only when absolutely necessary. If improvement is marked after the first stage a second operation may be declined; and again, in the two-stage operation one may have to deal with extensive adhesions which may complicate the technique of the second operation seriously.

2. A Short Note on Irregularities of the Heart in Association with Visceroptosis, by Dr. W. S. Morrow. (Published in this issue.)

Discussion: Dr. W. F. Hamilton: It would appear that cardioptosis is not an uncommon condition in connection with ptosis of other organs. *X*-ray examinations have proved this clearly and if one attends a clinic for a few years one would find scores of cases of "hanging heart", especially with long chest, low diaphragm, low kidney, and low stomach. Just what relation cardioptosis bears to neurasthenia is very difficult to define. I am inclined to think that the ptosis of the heart is but a small factor in the whole case and that the irregularity and disturbed cardiac function is a result rather of a general condition than of any local alteration of position the heart may show. It is true that the

possibility exists but I regard these cases in the light of a general condition rather than otherwise. One is reminded of cases of altered cardiac function where a very definite abdominal condition exists, e.g. gall stones. It is well known that recurrent gall stone attacks are associated with marked changes of cardiac function and on removal of the gall stones the heart returns to its normal state. Those cases of neurasthenia with panting in climbing up a hill should be regarded as possessing organic change, and not as cardiac neurasthenia. The musculature of these cases is impaired by toxins from nephritis or other causes.

Dr. W. S. Morrow: In reply to Dr. Hamilton I would say that I am quite ready to admit much of what he has said in a general way. At the beginning of my paper I spoke of how we all recognize a possible relation between general neurasthenia and cisceroptosis, but the point that I wanted to draw attention to was that in some cases we find disturbed heart action with very slight symptoms of neurasthenia in which the readiness with which the heart becomes affected on slight exertion is almost the only thing to suggest the possible presence of visceroptosis. As to the heart muscle being always diseased in these cases I must say that I cannot altogether accept this view because some of them seem to improve very much on fairly simple treatment. I have seen a great many cases in the last few years and my own impression is that when they are a good deal in the erect position there is liable to be a certain amoung of dragging on the abdominal organs which produces a condition of fatigue or irritation that makes them very liable to this irregular heart action. Certainly a good many of these show considerable dilatation but in many the heart seems to act normally at times and the symptoms assume the form of attacks of paroxysmal tachycardia which usually recover very quickly, so much so that if I find the heart is down two or three spaces I am apt to give a more favourable prognosis in a caseof tachycardia than if I cannot find cardioptosis present as a possible cause. I think Dr. Hamilton may go a little to the extreme in minimising the possible eflect of the ptosis itself, but I am quite willing to admit that there may often be more or less organic change associated with it.

Living Case: Intussusception in a Young Child with Torsion of the Small Intestine, by Dr. A. E. Garrow.

The child is six months of age and came into hospital about twenty-four hours after being seized with an attack of abdominal

pain with vomiting, the child was admitted about four o'clock in the afternoon having taken ill the night before. It is a breast fed baby, always in perfect health until the evening of February 6th. I saw the child on the afternoon of the following day with a history that it had passed a very restless night. After having this attack of abdominal pain and vomiting it passed blood or bloody stools on several occasions; vomiting was not very frequent. There was no distension of the abdomen but a definite sausage-shaped mass, best felt from the splenic flexure downwards along the descending colon as far as the brim of the pelvis. It had a characteristic feel, was sausage-shaped, curbed, and hardened during examination, but became soft at times. When it hardened the child was restless, though it did not cry very much, indeed was very quiet. The child was rather pale and on rectal examination a little bloody mucus escaped. Operation was performed soon after it entered the hospital and the interesting feature was that on opening the abdomen a markedly distended small intestine and markedly contracted small intestine. This was found to be due to torsion of the small bowel in its upper portion, apparently in the jejunum, the torsion being to the left and one and a half complete turns was required before the kink was taken out of the small intestine. This apparently had not long existed because there was not very much alteration in the colour of the bowel; whether it had been a more recent addition to the intussusception I cannot say. This had advanced as far as the left iliac fossa and was exceedingly easily reduced. In fact all that was necessary was to lift up the sigmoid bit by bit and it receded. It was the small intestine which had invaginated. Just when the intussusception was reduced the child stopped breathing and became of a leaden hue and the condition was alarming. While Dr. Bourne was giving the anæsthetic we carried out artificial respiration with cardiac massage and improvement occurred in a minute or two. The incision which I employed here is an incision through the rectus muscles displacing the rectus outward so that no nerve supply is cut. The advantage of this is seen; there is no weakness in the child's abdomen and healing was by primary intention and no attempt was made, nor have I ever made any attempt in reducing these, to do any stitching or shortening of the mesentery. I have had no recurrences and I have not practised any of the methods which have been recommended for preventing recurrences. I could not account for the alarming symptoms which developed at the time the intussusception was reduced; I did it without any dragging, simply lifting the

sheath and following it down and the intussusception reduced itself without the slightest difficulty.

Dr. Winnifred Cullis, Professor of Physiology in the London School of Medicine for Women, London, England, and a member of the British Commission on Venereal Disease, gave a graphic and very interesting account of the educational side of the campaign now being conducted against the social evil in Great Britain and Ireland. Her address was received with the closest attention, and was followed by a discussion in which the need of the development of the campaign along similar lines in this city and province was emphasized, and the active support by the profession of measures tending to this end, urged.

The Canadian Medical Association Journal

With which is incorporated the MONTREAL MEDICAL JOURNAL and the MARITIME MEDICAL NEWS

EDITOR

SIR ANDREW MACPHAIL

(On active service)

ACTING EDITORS

G. GORDON CAMPBELL, M.D.

MAUDE E. ABBOTT, M.D.

MONTREAL

OLD SERIES VOL. XLVII

NEW SERIES VOL. VIII

TORONTO

GEORGE N. MORANG

1918

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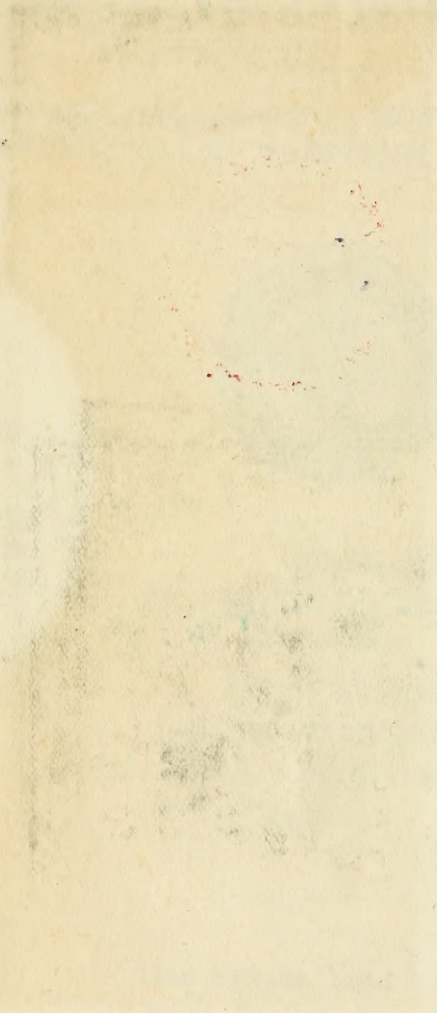

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